

Full Electron User
programs work on
BBC Micros with
OS 1.2 and Basic II

A Database Publication

electron

user

Vol. 1 No. 10 July 1984 £1

*Inside
this
action-
packed
issue*

Plot your year
— in 3D

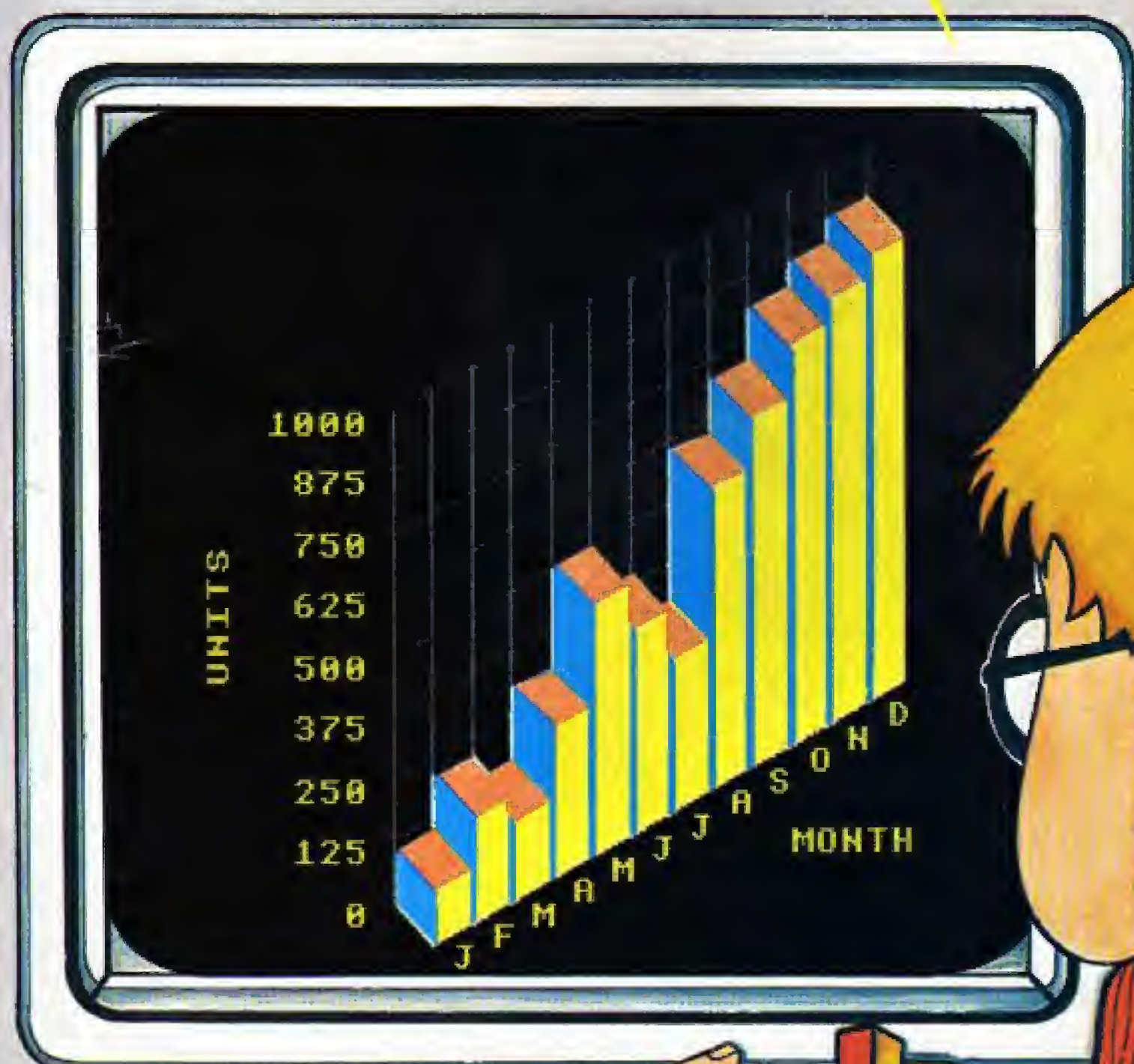
Tee-off for
Electron Golf

Double height
characters
made simple

Let your micro
help with
accounts

All about
FOR...NEXT
loops

Learn where
to DRAW
the line



FREE CONTEST
Win the First Byte
joystick interface

Expand your Electron.

NEW
ELECTRON INTERFACE UNIT

Now you can use your Electron computer with any standard printer using MUSHROOM's new printer and user-port interface.

Bring your Electron up to the same standard as the BBC Model B computer printer and user-port into which you can plug robot arms, joy sticks or any BBC user-port module.

On the whole range of MUSHROOM modules and interfaces, the Electron edge connector is extended to give you unrestricted compatibility with any other Electron interface.

All MUSHROOM interfaces can be used separately or can be combined into the unique MUSHROOM ELECTRO-RAK which is conveniently connected to the Acorn Electron by a short cable.

This greatly enhances the performance of the Electron and turns the system into a computer comparable with many larger mini systems and as you grow your computer can grow with you!

Ask for details on:

- * SIDEWAYS ROM CARD
- * A-D JOYSTICK INTERFACE
- * EPROM PROGRAMMER
- * MUSHROOM ELECTRO-RAK

- * FULLY CENTRONICS COMPATIBLE
- * FULL SOFTWARE PACKAGE (including screen-dump routine)
- * BBC COMPATIBLE 8-BIT USER PORT

£39.95 EX VAT



Mushroom

COMPUTERS LIMITED Aston Road, Bedford, Beds MK42 0LJ. Telephone: (0234) 55303.
Another Mushroom product from Broadway Electronics.



News

All that's new in the growing world of the Electron.

7

Solitaire

The Electron version of the classic logic game.

9

Beginners

Part six of our gentle introduction to Basic seems to be going round in circles!

10



Sounds Exciting

Yet more strange noises to enliven your Electron programs.

15

Notebook

A simple program simply explained. Times tables made easy.

16

Software Surgery

All you want to know about the latest in software from our frank reviewers.

19

Hardware Review

We take a close look at the First Byte joystick interface.

26

Guess the Word

As you might guess, a word game to keep you guessing.

27



Text Walk Tall

Double height characters can appear on your Electron. We show you how!

29

Classroom Companions

How the Electron shares the schoolroom with a class of primary school children.

31



Golf

Tired of zapping aliens? Let your Electron take you out for a day on the links.

32



Graphics

Electron graphics - we MOVE on and learn where to DRAW the line.

35

Contest

Become an Electron artist and have two chances at winning a First Byte joystick interface.

39

Bank Account

Where does all the money go? Let your Electron keep track of your spending.

43

Special Offers

Cassettes, back numbers and lots, lots more for the keen Electron user.

46



Casting Agency

More shapes from our readers to brighten your programs.

48

Showtime

Come and meet us at the Electron and BBC Micro User Show.

50

Chartist

A multicoloured, three dimensional bar chart for your Electron.

52



Formulae

Volumes, areas and trig. They're all made simple in Richard Rennie's program.

57

Micro Messages

The pages you write yourself. A selection from our mailbag.

61



SUBSCRIPTIONS

Subscribe now - and get Electron User delivered to your door each month.

Subscription rates for 12 issues, post free:

£12 UK
£13 Eire (IR £16)
£20 Europe
£20 Rest of world (surface)
£40 Rest of world (airmail)

Managing Editor
Derek Meakin

Features Editor
Pete Bibby

Production Editor
Peter Glover

Layout Design
Heather Sheldrick

Advertisement Manager
John Riding

Advertising Sales
John Snowden

Marketing Manager
Sue Casewell

Published by Database Publications Ltd

Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

Telephone: 061-456 8383 (Editorial) 061-456 8500 (Advertising)
Subscriptions: 061-480 0171 Telex: 667664 SHARETG Prestel: 614568383.

Trade distribution in the UK and overseas:
Contact Steve Fletcher, Circulation Manager of Database Publications at the above address, or telephone him on 061-480 4153.

Electron User is an independent publication. Acorn Computers Ltd, manufacturers of the Electron, are not responsible for any of the articles in this issue or for any of the opinions expressed.

Electron User welcomes program listings and articles for publication. Material should be typed or computer-printed, and preferably double-spaced. Program listings should be accompanied by cassette tape or disc. Please enclose a stamped, self-addressed envelope, otherwise the return of material cannot be guaranteed. Contributions accepted for publication will be on an all-rights basis.

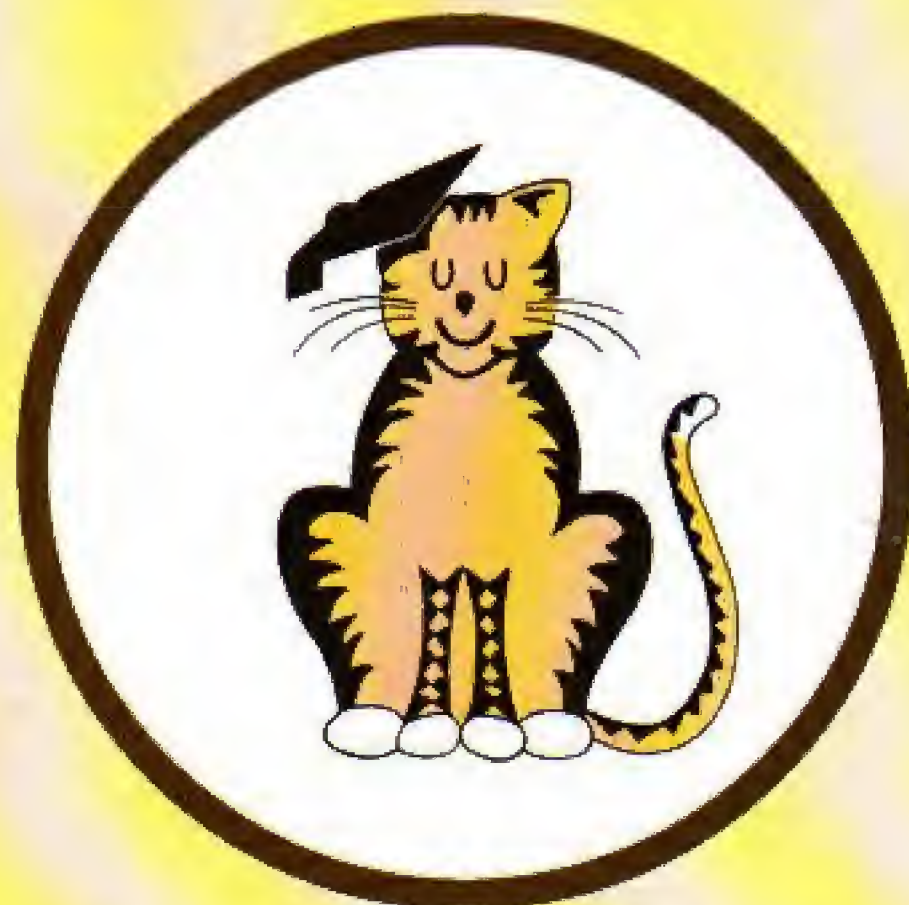
© 1984 Database Publications Ltd. No material may be reproduced in whole or in part without written permission. While every care is taken, the publishers cannot be held legally responsible for any errors in articles or listings.

CHESHIRE CAT

EDUCATIONAL SERIES

from

AMPALSOFT



CHESHIRE CAT

The First name in Educational Software.

An exciting range of top quality programs
Available for BBC, Electron, Dragon 64, Dragon 32.
Available shortly for Commodore 64, Spectrum 48K.

RETAILER ENQUIRIES WELCOME

Ampal Computer Services Ltd.,
31 Woodbridge Road, Darby Green, Blackwater,
Camberley, Surrey.
Tel: (0252) 876677.

Available from selected branches



Boots, W. H. Smith and Dragon Data Ltd.,
and other good computer stores

Electron Eddie-torial



The price of piracy ...

ONE of the nice things about the Spring Electron & BBC Micro User Show in London was that I was able to meet lots of Electron users.

Of course I've got to know quite a few of you through the mail I get, but it's not the same as actually meeting people in the flesh and hearing first hand what you want from *Electron User*.

The questions I was asked about the Electron ranged from simple ones – that even I could answer – to amazingly difficult ones – which I directed to my colleagues on the technical advice stand.

I hadn't realised what a clever lot you are and how

many of you cut your teeth on other micros.

The questions were fascinating and gave me lots of ideas for future issues of *Electron User*.

Among them all, though, one question stood out.

The questioner was a lady wearing an expensive-looking fur coat.

"How can you join two cassette recorders together?" she asked, sweetly.

"Using leads", I replied helpfully, "but I can't see why anyone would do that. Unless it was to copy

software, which is illegal".

The lady smiled even more sweetly and adjusted the dead animal round her shoulders.

"But *everyone* does it", she protested, "I'm just having a few problems".

I told her to ask *everyone* and moved on to the next question, seething.

How would you feel if someone asked your advice on how to be a better housebreaker or a nimbler pick-pocket?

And how do you think our well-off lady would feel if I asked her if she did

some shoplifting as well as ripping off software. No doubt she'd have been horrified.

"After all", she'd say, "copying tapes, ripping off software, it isn't stealing is it? Everyone does it".

The trouble is though, it is theft, and as companies whose products are regularly stolen try desperately to stay in business, it's putting up the price of software for everyone.

But then it's only the innocent who suffer, not the pirates who can afford fur coats. *Pete Bibby*

TO

electron

USERS & DEALERS

Signpoint Ltd.
Computer Technology

The first Joystick Interface
on the market.

JOYPORT

Controls over 90% of
available arcade games.

- * Uses 'Atari style' 9 pin joysticks
- * Just plugs in, no soldering
- * Full after sales support.
- * Does not overload the limited Electron power supply.
- * Now supplied with software tape.

£20.50 inc vat and P & P

Same Day Despatch

All orders received before July 1st 1984
at old price – £16.95

ALSO IN STOCK

PRINTPORT

Centronics Printer Interface.

- * Suitable for all Centronics Printers.
 - * Recognises *FX, VDU & CTNL Codes.
- Supplied complete with lead and software.

£44.95 inc vat and P & P

Send cheques to :—

Signpoint Ltd.,
166a Glyn Road,
London E.5.
Tel: 01-986 8137

PRINTER EXTRAVAGANZA

Order Today
Print Tomorrow
24 HOUR DELIVERY

We challenge you to find a better deal!

EPSON PRICE CRASH

The only
printer firm
OPEN 7 DAYS
A WEEK

EPSON RX80 (DOT MATRIX)	£219 + VAT = £251.85
EPSON RX80FT (DOT MATRIX)	£247 + VAT = £284.05
EPSON FX80 (DOT MATRIX)	£324 + VAT = £372.60
EPSON MX100 (DOT MATRIX)	£355 + VAT = £408.25
EPSON RX100 (DOT MATRIX)	£385 + VAT = £442.75
EPSON FX100 (DOT MATRIX)	£499 + VAT = £573.85

As FX 100 now in very short supply, telephone for alternatives

MAKING WAY FOR THE NEW



star

DOT MATRIX PRINTERS

The power behind the printed word.

STAR GEMINI 10X	£198 + VAT = £227.70
STAR DELTA 10	£325 + VAT = £373.75
STAR GEMINI 15X	Ring for stupid prices NOW
STAR DELTA 15	£499 + VAT = £573.85

WE WILL MATCH ANY GENUINE PRICE ADVERTISED

SCI(UK) IS NEVER BEATEN ON PRICE

MANY MORE PRINTERS AVAILABLE - 1000's OF SCI(UK) BARGAINS

SEND NOW FOR THE **FAMOUS** SCI(UK) CATALOGUE



for cheapest prices telephone 0730 63741 or 0730 61745



MORE SCI(UK) BARGAINS

SHINWA CP80	£179 + VAT = £203.85
BROTHER EP44	£179 + VAT = £203.85
CPP 40 Colour printer/plotter ...	£109 + VAT = £125.35
RITEMAN A1	£229 + VAT = £263.35
FIDELITY 14" Colour monitor/video	£189 + VAT = £217.35

DAISYWHEEL PRINTERS

JUKI 6100	phone for stupid price
DAISEYSTEP 2000 ...	£279 + VAT = £320.85
UCHIDA DWX305 ...	£279 + VAT = £320.85
BROTHER HR 15	Ring for stupid price NOW

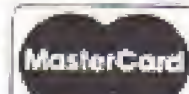
New from the world famous **CANON** Company

CANON 1080A NLQ DM best value ever at £319 + VAT = £366.85

CANON 1156A New wide bodied NLQ DM

Sensational value at £399 + VAT = £458.85

We have interfaces for all types of computers, including CBM 64, VIC 20, APPLE, TRS 80, IBM, BBC, SPECTRUM, QL, etc.



24 HOUR SECURICOR DELIVERY £9.50 plus VAT • BANKERS ORDERS, BUILDING SOCIETY CHEQUES, POSTAL ORDERS - SAME DAY
ALL ORDERS COVERED BY THE MAIL ORDER PROTECTION SCHEME • NATIONWIDE MAINTENANCE CONTRACTS ARRANGED

EDUCATIONAL DISCOUNTS VERY WELCOME

Its **SUNDAY** - Do you realise you can order NOW - We are open 7 DAYS A WEEK.

DEALER ENQUIRIES
WELCOME
WRITE FOR DETAILS

SCI(UK)

SCI (UK) FREEPOST (No Stamp needed)
PETERSFIELD HANTS GU32 2BR

0730 61745
0730 63741

EXPORT ENQUIRIES
NO TAX
DELIVERY AT COST

Personal callers welcomed. Unit 15, Inmans Lane, Sheet, PETERSFIELD, Hants. TELEX 86626 MYNEWS G

electron user NEWS



Expansion unit arrives – and it's official!

AT long last the first official Acorn hardware expansion unit for the Electron has been released.

Known as the Plus 1, and retailing at £59.90, it promises to take the Electron into the realm of serious computing expanding its capabilities, allowing it to use a printer, joysticks and solid-state program cartridges.

The matching unit is firmly attached to the back of the Electron by means of two screws and the overall size of the combination is about that of the BBC Micro.

It needs no external power supply, drawing its power from the Electron's edge connector.

Two proportional joysticks can be used via an 8 bit, four channel A-to-D converter. This will enhance both games and educational software.

In its more serious role the Plus 1 also enables the Electron to drive a Centronics type printer, allowing it to produce hard copy of listings and perform as a word processor.

Joystick and printer interfaces are already available from other manufacturers. The most original and excit-

Plug-in ROMs cut waiting

ing feature of the Plus 1 is that it has two slots that allow the use of software cartridges.

When the cartridges are slotted in the program is immediately available, sparing Electron users the long wait while the cassette tape loads.

The software will cover a wide range from games to educational programs, and from computer languages other than Basic to word processors.

Among the first six cartridge releases are four classic Acornsoft games – Snapper, Starship Command, Hopper and Countdown to Doom.

Educational software is represented by the Tree of Knowledge, while Lisp is available for those wishing to expand their range of languages.

The cartridge slots will also take hardware extension cartridges allowing further Electron expansion.

Acorn give the example of an RS423 serial interface for connection to serial printers, modems and other computers.

Further hardware extension cartridges are planned for the Plus 1, which Acorn sees as only the first in a series of Electron hardware expansion units.

Telephone link on way

ELECTRON owners who feel that they have been left out of the computer communications revolution need worry no longer.

When Minor Miracles of Ipswich finish development work on their RS232 interface, the Electron will soon be able to talk to other micros and even main-frame computers.

Standard on the BBC Micro but lacking on the Electron, the RS232 port is the normal method of getting information out of one micro and into another – usually over telephone lines by way of a booster device or modem.

The interface will be used to link the modem directly into the Electron via the expansion bus.

...and printer interface

THE July Electron and BBC Micro User Show will see the launch of a new printer interface for the Electron. It will be released by First Byte Computers of Derby, manufacturers of the joystick interface.

They claim it will be the cheapest on the market.

The interface will not require additional software to make it operational and will allow all the normal printing control codes.

Micros answer to road deaths

A CALL has gone out to the ever increasing army of computer whizz kids to come up with an electronic answer to help keep death off the roads.

They are being invited to take part in a major contest to write the best computer program for the Electron or BBC Micro on the theme

of road safety.

Open to all school-children in the Greater London area, the new contest is being sponsored by the publishers of the *Electron User* and *The Micro User* magazines.

Posters and copies of the rules have already been sent out to more than 2,000 primary and

secondary schools, with disc drives being offered as prizes.

Judging and awards will take place at the Electron and BBC Micro User Show, to be held at Alexandra Palace from July 19 to 22.

The Royal Society for the Prevention of Accidents and the Metropolitan Police are

backing the contest and will be involved in selecting the most original programs.

"We feel that road safety schemes in the past have tended to talk down to children", says Mike Cowley, a spokesman for Database Publications, organisers of the contest.

"The Green Cross

Code man and the squawking parrot are prime examples of the rather patronising approach of adults.

"Here then is an opportunity for children themselves to show what they can do by using their knowledge of the new technology to make a real impact on the road safety front".

Programs made easier

AMONG the flood of books that have been published for the Electron are three that should make life easier for those new to programming.

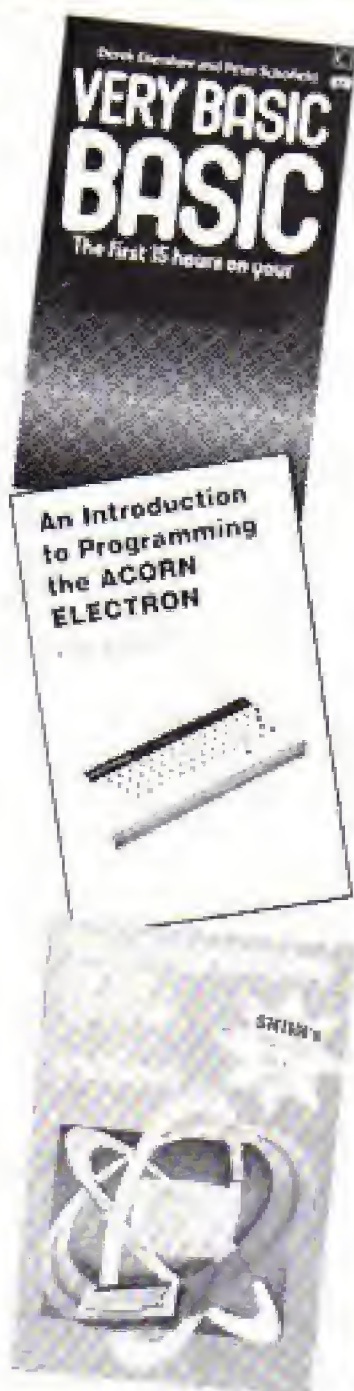
From Century Publishing comes "Very Basic Basic". Written by Derek Ellershaw and Peter Schofield, the book is designed to guide the new Electron user through the first few weeks of programming.

With a simple, non-technical approach, it is aimed specifically at those who find even the User Guide difficult.

Along the same lines, but with an added foray into the world of interfacing, is "An Introduction to Programming the Acorn Electron".

Written by R.A. and J.W. Penfold and published by Bernard Babani, the book takes a practical, step-by-step approach to learning Electron Basic.

The last of the trio is "Easy Programming for the Electron", published by Shiva. The author, Eric Deeson, already well known for his books about the BBC Micro, starts at basics and instructs the beginner in a lighthearted but informative manner in the intricacies of the micro.



More joystick links released

HOT on the heels of its first two hardware additions for the Electron, a new peripheral has been released by Sir Computers of Cardiff.

Demand for their Electron Printer/ADC Interface and the ROM/RAM Expansion Board has been so great the firm has been encouraged to add to its range of products.

The new peripheral is a combined Centronics printer and switched joystick interface. This differs from their previous joystick interface in that it allows the Electron to use two sets of switched joysticks.

Switched or Atari-style joysticks differ from the analogue-to-digital joysticks available on the previous

interface. They are also more popular with games players.

"Basically we're doing what everyone else is doing", said Paul Kathro of Sir Computers, "but we're doing it properly".

The latest interface will hold its software in ROM, avoiding the need for a cassette tape to be loaded before the game is played. The ROM also contains a screen dump facility for Epson printers.

Sir claims that the new unit is compatible with every piece of Electron software available.

YET another joystick interface for the Electron is about to be launched as soon as

sufficient quantities have been manufactured.

Produced by Wizard Development of Sheffield, it will allow two sets of switched joysticks to be used.

"Basically it's a little black box that sits on the back of the Electron and allows you to use two sets of switched, Atari-style joysticks", according to a Wizard spokesman.

Said to be capable of handling any commercial game that uses joysticks, the interface has its software built into the hardware. This obviates the need for cassette based software to be run before the game is loaded.

The company intends to enter the Electron software market soon.

Expansion bus 'no weak link'

AN Acorn spokesman has quashed rumours concerning the robustness or otherwise of the Electron's expansion bus.

"Absolute rubbish" was his firm response to being told of reports that the bus could not

withstand more than 100 connections and disconnections of peripherals.

A strong and reliable part of the Electron, the bus was certainly harder than the reports made out.

However, like any other electrical cir-

cuit, it has to be treated with respect.

But the Acorn spokesman pointed out that the bus wasn't designed specifically for peripherals that were continually being attached and then taken off.

The concept was that the official Acorn product would be fitted to the Electron and not removed, further expansion units "piggybacking" on it. This would avoid any wear and tear of the expansion bus, he said.

JULY 1984 ELECTRON USER 9

And now FOR our NEXT trick...

THE last article in this series left you with a program to run and try and understand. All it did was to ask you to enter 10 numbers and the Electron then printed out their total.

There was nothing particularly original in it, but there were two new key words, FOR and NEXT.

This month we'll be taking a closer look at FOR and NEXT and seeing how they work in combination to form what's known as a FOR . . . NEXT loop.

We'll be sampling just a part of the power released in our programs by using these FOR . . . NEXT loops and seeing how they work with the INPUT statement we talked about in the June issue of *Electron User*.

For the moment, however, let's have a look at how we would write a program which

would ask for 10 numbers, add them up and give us their total.

This would do the same job as Program VIII last month. But as we don't know what they are yet we'll have to do it without the FOR . . . NEXT loops.

Program I shows how it's done.

It makes a total of 23 lines in all. Notice the use of meaningful variable names like *running_total* and *new_number*.

These are deliberately written in lower case letters to make them stand out and also to stop them clashing with Basic key words which are

always in capitals.

Incidentally, that's not a hyphen in the variable names – punctuation marks aren't allowed. What looks like a hyphen is actually the underline mark which you'll find sharing the key with the downwards pointing arrow.

Take a look at Program I and see if you can spot a sort of common theme running through its lines.

You'll see that lines 30 and 40 and lines 50 and 60 are exactly the same, apart from their line numbers.

This isn't all that surprising when you consider they do the same things. Each pair of lines asks for a new number and then adds it to the running total.

In fact the same pair of lines, differing only in the line numbers, appear 10 times in the program.

I hope that you didn't type them all in separately but used the cursor keys and Copy to reproduce them easily.

You didn't? Well, you will next time.

Even so, having all those lines that are practically the same and do the same job must be a little inefficient, to say the least.

It would be nice if there were some way of just typing in the lines that do the work and telling the Electron to get on with it and obey them the required number of times.

Happily there is a way, in the form of a FOR . . . NEXT loop. This allows the Electron to perform the same lines over and over again a specified number of times. This is known as a loop.

The lines you want repeated come between the line

with the FOR in it and the line with NEXT in it.

The FOR tells the Electron that it's come to the start of the lines that want repeating, the NEXT that it's come to the end of them. Figure 1 shows this diagrammatically.

However, it's not quite that simple. We can't just use "a certain number of times" to tell the micro how often we want the enclosed lines to be repeated.

The Electron requires us to tell it how many repetitions we want in number form. This is so it can keep track of the number of loops by counting.

It's quite easy. All we do is set up a variable to keep track of things and tell the Electron the range that variable – the loop control variable, to be formal – will vary over.

Don't worry if that seems a bit odd. Just run Program II and it'll make sense.

```
10 REM PROGRAM II
20 FOR finger=1 TO 10
30 PRINT "Hello!"
40 NEXT finger
```

When the Electron obeys this program you get 10 "Hellos" on the screen. That's not too astounding – the interesting bit is the way it is done.

As you can see, line 30 is the one that PRINTs the message on the screen, and it does it not once, but 10 times.

This is because line 30 comes between the FOR of line 20 and the NEXT of line 40, which set up a loop that the micro performs over and over. But why 10 times?

The number of times that the Electron processes the loop is determined by the

```
10 REM PROGRAM I
20 LET running_total=0
30 INPUT "New number "new_
  number
40 LET running_total=runni
  ng_total+new_number
50 INPUT "New number "new_
  number
60 LET running_total=runni
  ng_total+new_number
70 INPUT "New number "new_
  number
80 LET running_total=runni
  ng_total+new_number
90 INPUT "New number "new_
  number
100 LET running_total=runni
  ng_total+new_number
110 INPUT "New number "new_
  number
120 LET running_total=runni
  ng_total+new_number
130 INPUT "New number "new_
  number
140 LET running_total=runni
  ng_total+new_number
150 INPUT "New number "new_
  number
160 LET running_total=runni
  ng_total+new_number
170 INPUT "New number "new_
  number
180 LET running_total=runni
  ng_total+new_number
190 INPUT "New number "new_
  number
200 LET running_total=runni
  ng_total+new_number
210 INPUT "New number "new_
  number
220 LET running_total=runni
  ng_total+new_number
230 PRINT "The total is
  ";running_total
```

Program I



control variable *finger*.

After the FOR of line 20 we have "*finger*=1 TO 10". This tells the Electron to set up the variable *finger* and give it an initial value of one. It is then to perform all the lines that follow until it comes to a NEXT.

When it finds the NEXT, which marks the end of the lines to be repeated, the micro adds one to the loop control variable *finger* and goes back to the beginning of the loop and does it all over again.

Each time that the set of lines inside the FOR and the

NEXT is repeated the control variable *finger* has one added to it.

Eventually the control variable will reach the limit that's been set. This limit is the number that follows the TO in the line that starts the loop. In this case it is 10.

When *finger* equals 10, the Electron performs all the lines in the loop again – the tenth time.

It then comes to the NEXT which adds one to the value of *finger*. This is now 11, one

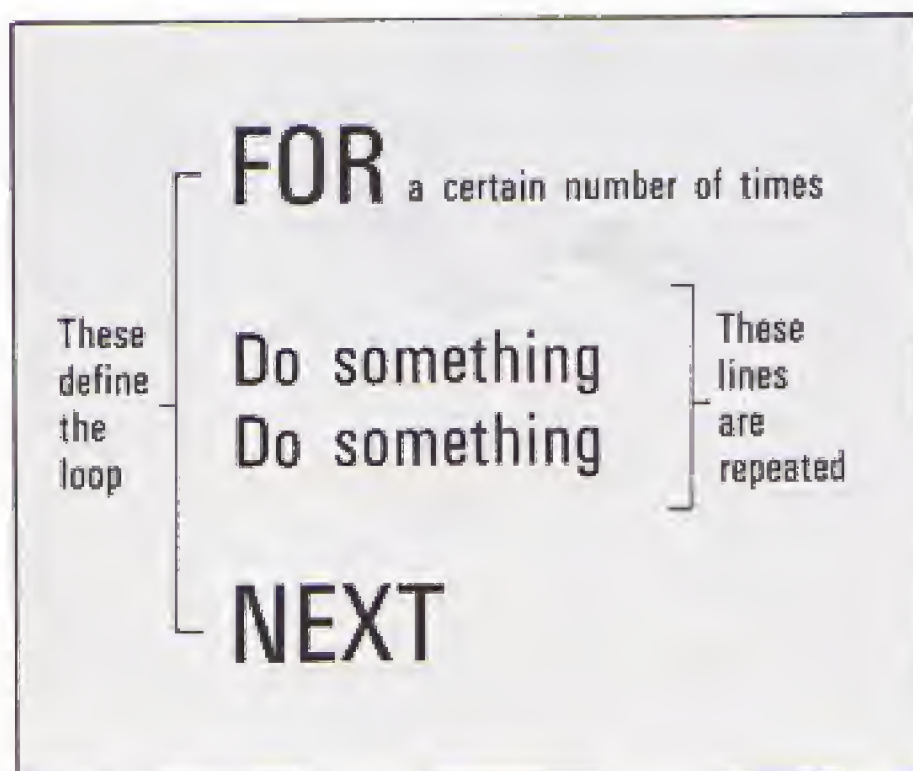


Figure I: A FOR . . . NEXT loop

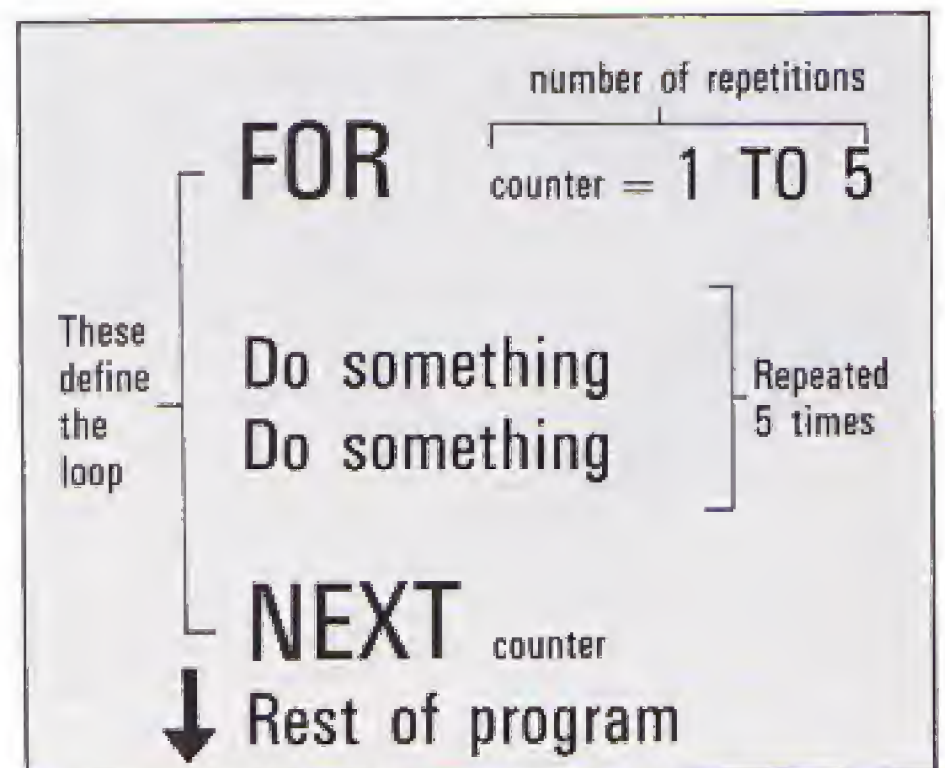


Figure II: Loop control variable

From Page 11

more than the upper limit of the control variable.

The Electron now stops going round the loop and carries on with the rest of the program – or would do if there were any more lines. This is shown in Figure 11.

Really the Electron is just doing what we all do when we're repeating something several times. We count to keep track of where we are.

When our count reaches the number we wanted – the limit – we go off and do something else.

If you're as bad at maths as I am, you count on your fingers. Hence the name of the loop control variable in the previous program.

Before you run Program III, try and work out what it does and see if you're right.

```
10 REM PROGRAM III
20 FOR counter=1 TO 5
30 PRINT "Here we go again"
40 NEXT counter
```

What happens is that we get five "Here we go agains" on the screen. The loop is set up with the FOR in line 20.

This line also tells the Electron that it is to count from one to five using the control variable *counter*.

There's only one line between the FOR and the NEXT so that line 30 is repeated five times.

Each time round the loop, the loop variable *counter* is incremented by 1 and when it is over the limit – in this case 5 – the loop stops.

If you don't believe that the Electron increments the loop counter each time round, try adding a line like:

```
25 PRINT counter
```

to the program and you'll see it happening.

You'll have noticed that in both the previous programs the NEXT has been followed by the loop control variable. In the first case it was *finger*, in the second it was *counter*.

Strictly speaking you don't to have the loop control variable following the NEXT. The Electron doesn't need it there.

Having said that, I nearly

always put it in as in long, complicated programs, while the Electron may not lose track of which variable controls which loop, I do.

Program IV shows the NEXT on its own. The loop control variable is called *loop* and as it goes from 1 to 3 the message appears three times.

```
10 REM PROGRAM IV
20 FOR loop=1 TO 3
30 PRINT "Not again!"
40 NEXT
```

The numbers that we give the FOR to control the loop don't have to be positive. Take a look at Program V:

```
10 REM PROGRAM V
20 FOR control=-1
TO 2
30 PRINT "Yet again!"
40 NEXT control
```

Here the control variable, *control* ranges from minus one to two. As one is added to it each time round the loop, the message appears four times.

If you're puzzled as to why it's four messages and not three, remember that the control variable goes up by one each time round the loop.

This means that *control* will have the values -1, 0, 1 and 2. There are four values in all, hence the loop is performed four times and the four messages appear.

So, to recap, we've learnt the following five things about a FOR...NEXT loop:

- The lines that appear between a FOR and a NEXT are repeated over and over in what is known as a loop.
- The FOR marks the start of the loop. The lines that come after it are the ones that will be repeated.
- Also after the FOR comes the control variable and its range.
- The NEXT marks the end of the lines that are to be repeated and adds one to the control variable each time round the loop.
- The control variable keeps track of how many times the loop has been repeated.

One of the many powerful features of a FOR...NEXT loop is that we can use the control variable inside the lines that make up the loop as a kind of counter.

Program VI shows this happening:

```
10 REM PROGRAM VI
20 FOR number=1 TO 7
30 PRINT "This is pass
number ";number
40 NEXT number
```

As you might expect by now, the program performs line 30 seven times. However the message each time is different.

This is because the last thing PRINTed by line 30 is the loop control variable *number*.

As this has increased by one each time round the loop – known as a pass – so the number at the end of the message changes. This can be a very useful programming tool.

Take a look at Program VII which displays the multiplication table for 10:

```
10 REM PROGRAM VII
20 FOR multiple=1
TO 12
30 PRINT ;multiple;" times
10 is ";multiple*10
40 NEXT multiple
```

Here the loop control variable *multiple* increases from 1 to 12 as the program goes round the loop. As *multiple* also appears in line 30, the line that is repeated by the loop, so the times table appears.

If you want to see how much work that simple use of a FOR...NEXT loop has saved you, try producing the 10 times table using only PRINT statements.

Program VIII shows a new aspect of FOR...NEXT loops, combining them with an INPUT statement.

```
10 REM PROGRAM VIII
20 INPUT "What times table
do you want",table
30 FOR multiple=1
TO 12
40 PRINT ;multiple;" times
";table;" is ";multipl
e*table
50 NEXT multiple
```

It's more or less the same as the previous program, only the INPUT of line 20 allows you to choose whatever table you wish.

There are only five lines in

this program, one of which does nothing, but as you'll realise if you run it a few times, it's very powerful indeed.

FOR...NEXT loops, combined with INPUT statements can be the basis of some very effective programming techniques.

And now we come to Program IX, the problem program left over from June. If you've followed the above, you should be able to understand it.

```
10 REM PROGRAM IX
15 REM JUNE'S PROGRAM VIII
20 total=0
30 FOR loop=1 TO 10
40 INPUT "Enter number"
,number
50 total=total+number
60 NEXT loop
70 PRINT "The total is ";
total
```

It's a simple FOR...NEXT loop that repeats the lines inside it 10 times. These repeated lines just ask you to input a number, held in the variable *number*, and add it to a running total held in *total*.

After 10 passes through the loop, the program then goes on to print out *total*, which is the sum of the numbers you've put in.

Simple isn't it? Anyway, it's certainly a lot easier than Program I.

And now you know so much about loops, try your hand at the following two programs. In Program X, why is the final value of *loop* 6 and not 5?

```
10 REM PROGRAM X
20 FOR loop=1 TO 5
30 PRINT "Pass number
";loop
40 NEXT loop
50 PRINT "Final loop is
";loop
```

And what's happening in Program XI?

```
10 REM PROGRAM XI
20 FOR loop=5 TO 1
30 PRINT "Something's
wrong here!"
40 NEXT loop
```

I leave it up to you to find out.

FIRST BYTE

ELECTRON JOYSTICK INTERFACE



ELECTRON JOYSTICK INTERFACE

Electron users! This is the add-on everyone wants: the new Electron switched joystick interface from First Byte - available now with free conversion tape that vastly extends your game range right away.

The interface operates with all 'Atari-style' 9-pin joysticks, and its many advanced design features put it way out in front for quality and reliability. That's why, to date 15 major software houses are already bringing out games that work directly with the First Byte Electron Joystick Interface - and many more are sure to follow.

FREE conversion tape - play all these top games right now

Every Electron Joystick Interface comes with a free conversion tape, so you can use some of the most popular games around right now:

- | | | |
|------------------------|------------------|-------------------|
| • Killer Gorilla | • Kamakazi | • Lunar Rescue |
| • Moonraider | • Chuckie Egg | • Bugblaster |
| • Positron | • Atom Smasher | • Blagger |
| • Croaker | • Alien Break In | • Bed Bugs |
| • Swoop | • Birds of Prey | • Alien Dropout |
| • Bandits at 3 o'clock | • Galaxy Wars | • Qaredevil Demos |
| • Escape from | • City Defence | • Snooker |
| • Moonbase Alpha | • Monsters | • Diamond Mine |
| • Cybertron Mission | • Pool | • Vortex |
| • Cylon Attack | • Pengwyn | |

The conversion tape also allows you to configure most other games for joystick control.

Games specially for the First Byte Interface

All these major software houses are bringing out games that work with the First Byte Electron Interface, with no conversion tape needed.

- | | | | |
|-----------------|------------|------------|---------------------|
| • Alligata | • Romik | • Aardvark | • Software Invasion |
| • A & F | • Bug-Byte | • Opima | • MRM |
| • Program Power | • Visions | • Postern | • Beebugsoft |
| • Supenor | • Virgin | • Phoenix | |

The First Byte Electron Joystick Interface - available now from all good dealers and W. H. Smith.

Look at these advanced design features.

Works with all 'Atari-style' 9-pin joysticks and utilises rapid-fire mode on Quickshot 2.

Only 2 chips for ultra-high reliability and low power consumption ensuring safe operation with the Electron.

Custom-built, colour-co-ordinated case in high-impact plastic. Special fitments ensure that when the joystick is plugged in, the case takes the strain, not the soldered joints.

Gold-plated connectors ensure a perfect contact. Metal polarising key and nylon end caps ensure positive locking.



A GENUINE FIRST BYTE
ADD-ON

First Byte Computers,
10, Castlefields,
Main Centre, Derby.
DE1 2PE
Tel: Derby (0332) 365280

Here's something **SPECIAL** from



We've commissioned four rip-roaring games for the Electron and BBC Micro

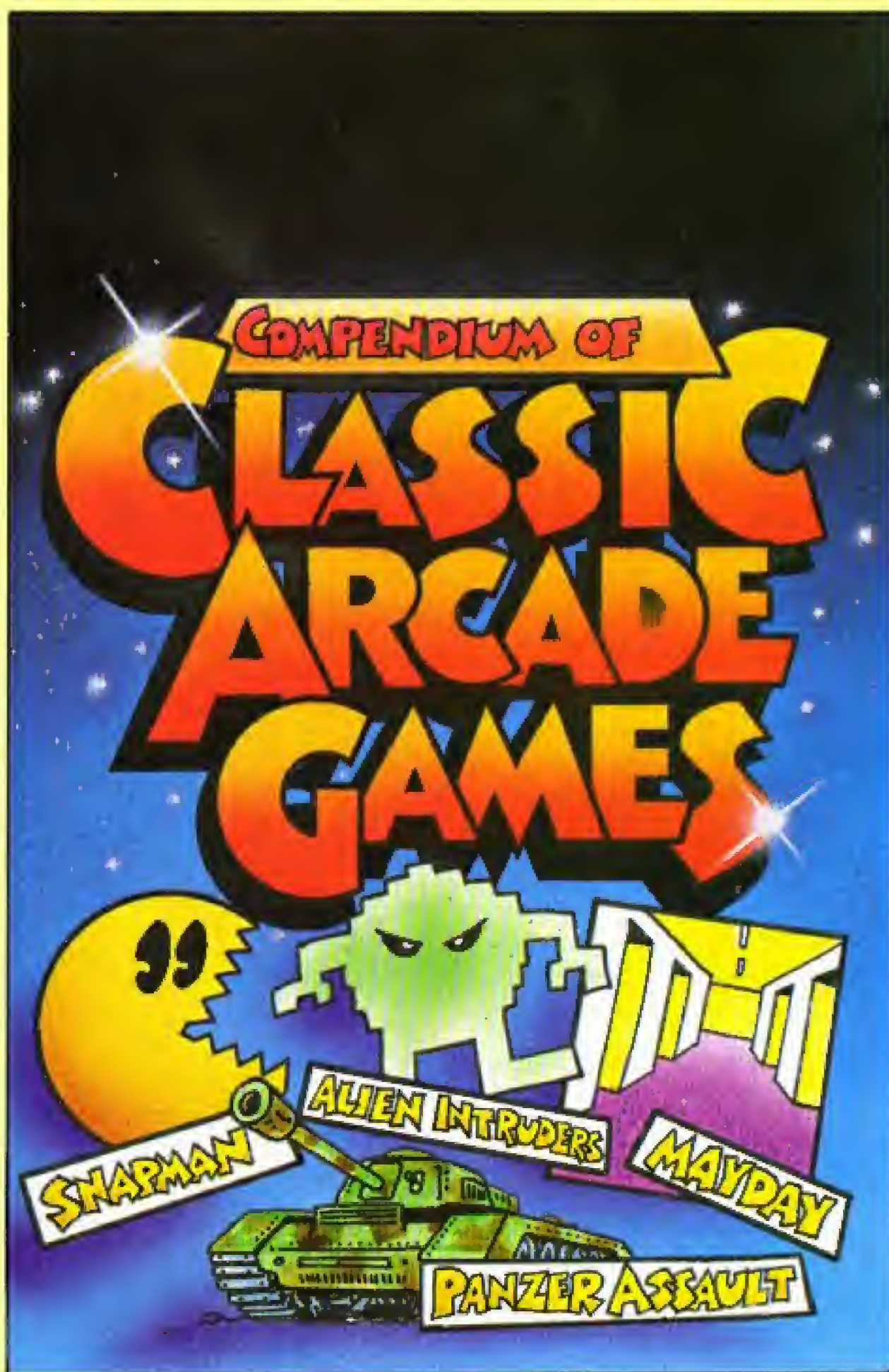
Three of this high-powered collection are top-rate machine-code versions of arcade classics and the fourth is a thrilling real-time adventure game. There's hours of enjoyment and something to suit everyone in this unique value for money collection

SNAPMAN – Guide your man through the maze as he munches energy pellets and avoids hostile aliens

ALIEN INTRUDERS – With only your laser for protection you must destroy the waves of aliens who threaten to engulf you

PANZER ATTACK – You are a tank commander engaged in vicious combat against encircling enemy forces

MAYDAY – A futuristic adventure! As captain of an interstellar cruiser you must guide the sole survivor of a stricken space freighter through the wreckage of his craft. If you fail to recover those vital medical supplies a whole planet is doomed!



Please send _____ copy/copies of
Classic Arcade Games.
I enclose a cheque/PO No. _____
for £ _____
made payable to: Database Publications Ltd.

- ☐ Electron tape £5.95
 - ☐ BBC Micro tape £5.95
 - ☐ BBC Micro disc £7.95
- (Please tick)

Name _____

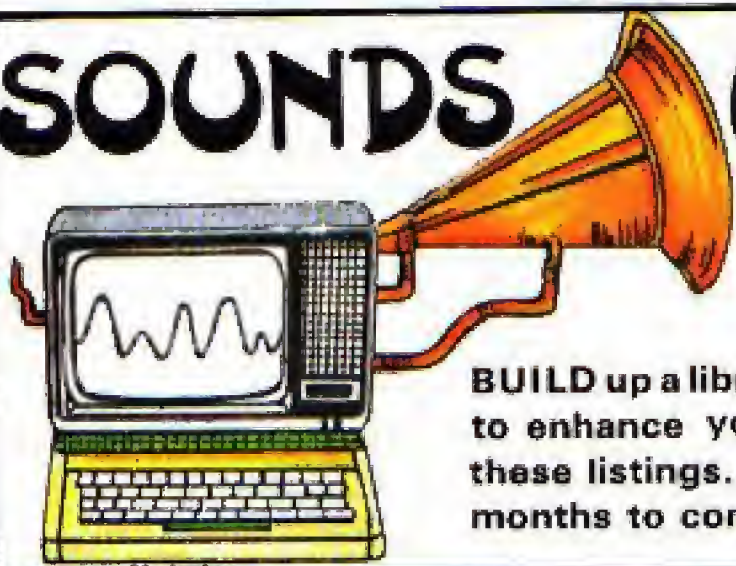
Address _____

Post code _____ Tel: No. _____

Post to: Classic Arcade Games offer, Electron User, 68 Chester Road, Hazel Grove, Stockport SK7 5NY

SOUNDS

EXCITING



BUILD up a library of exciting sounds to enhance your own programs with these listings. And many more in the months to come!

DOG WHISTLE

From Richard Crees
Hungerford,
Berks.

SOUND 1, 255, -15, 25



TOO MANY CHOCOLATES

From "Daniel in Yorkshire"

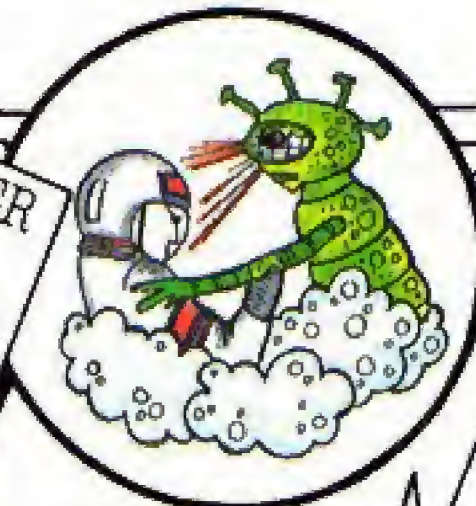
ENVELOPE 1, 5, 255, -255,
255, 0, 5, 10, 126, 0, 0,
-126, 126, 126
SOUND 1, 1, 100, 100



ALIEN LASER

From J. Blakey,
Heckington, Lincs.

10 ENVELOPE 5, 1, 10, -10,
10, 2, 1, 5, 126, 0, 0,
-126, 126, 126
20 SOUND 1, 5, 128, 15



OVERLOAD

From N.J. Clarke,
Dorchester, Dorset

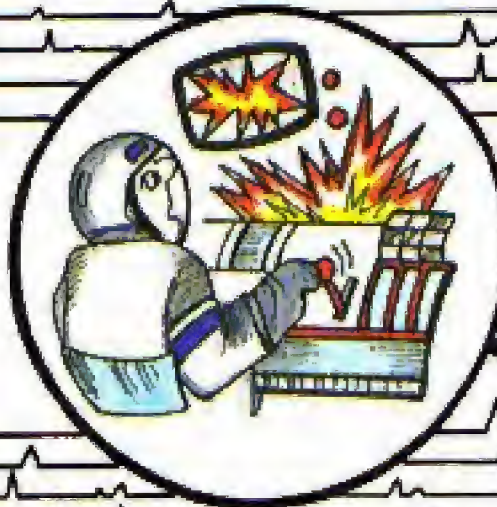
ENVELOPE 3, 3, -186, -255, -32,
-49, 255, 255, 126, 0, 0,
-126, 126, 126
SOUND 1, 3, 3, 255



AIR LEAK

From N.J. Clarke,
Dorchester, Dorset

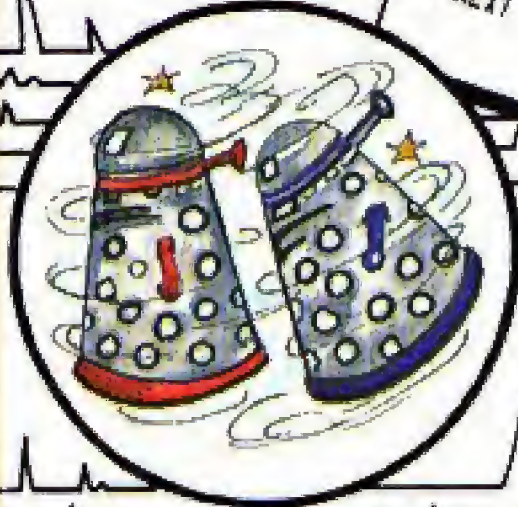
ENVELOPE 1, 1, 1, 12, 1, 1,
17, 11, 126, 0, 0,
-126, 126, 126
SOUND 1, 1, 1, 255



DIZZY DALEKS

From R. Traherne

10 FOR G=100 TO 165 STEP 3
20 FOR F=G+20 TO 6 STEP -1
30 SOUND &12, -15, F, 1
40 SOUND &12, -15, F-5, 1
50 SOUND &12, 0, F-5, 1
60 NEXT
70 NEXT



PERCUSSION

From N.J. Clarke,
Dorchester, Dorset

10 FOR S=220 TO 0 STEP -10
20 SOUND 0, -15, S, 5
30 NEXT S



Do you have any sounds for Sounds Exciting? Send them into Electron User and hear yourself in print. The address: Sounds Exciting, Electron User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

Notebook Part 6

```

10 REM TIMETABLE
20 REM BY J.C. CURTIS
30 REM ELECTRON USER
40 MODE 6
50 PRINT "... PLEASE ENTER
  THE TIMES TABLE REQUIRED
  ."
60 INPUT A%
70 PRINT "... PLEASE ENTER
  THE AMOUNT YOU WISH
  THE TABLE TO GO UP
  TO"
80 INPUT B%
90 FOR CX=1 TO B%
100 DX=CX*A%
110 PRINT CX;" * ";A%;" =
  ";DX
120 NEXT
130 PRINT " PRESS SPACE
  TO CONTINUE"
140 REPEAT UNTIL INKEY (-99)
150 GOTO 10
  
```

REM's
for humans

TIMES TABLE is a simple but interesting program sent in by one of our readers, J.C. CURTIS. You just pick which table you want and what number you want to go up to and the Electron does the rest.

INPUT
routines

FOR...NEXT
loop

Delay until
space bar pressed

Calculates results

Prints out the answers

Back to the beginning

10-30

The usual REM statements giving information to humans but not to the Electron.

40

Puts the Electron into Mode 6.

50

The message in inverted commas appears on the screen. The apostrophes make the Electron miss a line when it prints. This makes the display neater.

60

Allows the user to tell the Electron which table is required. This value is stored in the integer variable A%. The fact that an integer variable is used means that only whole numbers will be used for the tables.

70-80

These lines ask the user for the limit of the table and stores this in another integer variable, B%.

90-120

The FOR...NEXT loop which does all the work, printing out the table. At the beginning of the loop the counter C% is set to 1. Each time round the loop C% is increased by 1 and when C% equals B% (the limit chosen for the tables in line 80) the loop stops.

100

Works out the result of multiplying the times table number (A%) and the current value of C% each time round the loop. The answer is placed in the variable D%.

110

Prints out the result of the above calculation.

120

Sends the Electron back to line 90 if C% is less than the limit B%. When the two are equal the program goes straight onto the next line.

130

Prints the message in inverted commas.

140

The program just loops aimlessly, doing nothing, until the space bar is pressed. The Electron then goes on to the next line.

150

Sends the program right back to the beginning again.

Don't
forget your
times table
manners

Trevor Roberts

Now YOU can go for gold ...with the



Fancy pitting yourself against the world's best at this summer's Olympics?

You can do so without going anywhere near Los Angeles — with the most challenging package of programs of 1984.

MICRO OLYMPICS is more than a game. It's a brilliantly written collection of ELEVEN track and field events.

And because we know we're going to sell many thousands of them we've brought the price right down — to just £5.95.

Ever imagined yourself as another Seb Coe? Then try to run against the world record holder at 1500 metres. And if that distance is too much for you then there's always the 100, 200, 400 and 800 metres to have a go at.

Not much good at running? Don't worry. MICRO OLYMPICS has many more challenges for you. Why not try your skill at the high jump or the long jump?

And if you can't beat the computer at running or jumping then you can always throw things around in frustration! The trouble is that it's just as hard to be a champion at the discus, the hammer or the javelin.

And the pole vault takes the event to new heights!

Yes, it's fast, furious fun, pitting yourself against the world's best times and distances on your micro.

You may not be another Steve Ovett or Alan Wells, but with practice you COULD become the Micro Olympics Champion!

*This is a special joint offer from
The Micro User and Electron User*



**Play Micro Olympics
— and let your fingers
do the running!**

Send for it today

Please send me _____ copy/copies of
Micro Olympics

☐ I enclose cheque made payable to
Database Publications Ltd.
for £ _____

I wish to pay by

☐ Access ☐ Visa No. _____ Expiry date _____

Signed _____

Name _____

Address _____

<input type="checkbox"/> BBC 'B' cassette	£5.95
<input type="checkbox"/> Electron cassette	£5.95
<input type="checkbox"/> BBC 40-track disc	£7.95
<input type="checkbox"/> BBC 80-track disc	£7.95

Please tick box

Post to: Micro Olympics offer, Database Publications,
68 Chester Road, Hazel Grove, Stockport SK7 5NY.

REGARDEZ

LANGUAGE LEARNING AIDS FOR
FRENCH, GERMAN & SPANISH

FOR BBC(32K) · ELECTRON
SPECTRUM (48K)

As used in numerous schools and colleges these programs provide a highly successful aid to modern language learning. Each cassette contains a sophisticated control program and a comprehensive series of vocabulary lessons which can be used in a variety of self-paced learning and test modes. Words, phrases etc are displayed with all necessary accents and special characters. Different colours are used for masculine, feminine and neuter words to assist gender learning.

The programs are suitable for beginners, O-level and beyond as simple commands enable new lessons in vocabulary or grammar to be created by the user, edited as required, then permanently saved for later use. Invaluable for homework and exam revision!

Two cassettes are available for each language, together these contain a vocabulary of thousands of words; Level A provides 16 lessons in general subjects; Level B provides a further 16 lessons including adjectives, adverbs and fully conjugated verb lists.

Available from your computer store or by mail order Price £9.95
Also Available "ANSWER BACK General Knowledge Quiz" Price £10.95



KOSMOS
SOFTWARE

KOSMOS Software 1 Pilgrims Close, Harlington, DUNSTABLE, Beds. LU5 6LX
Telephone (05255) 3942

Please supply the following programs

The French Mistress Level A @ £9.95	<input type="checkbox"/>	The French Mistress Level B @ £9.95	<input type="checkbox"/>
The German Master Level A @ £9.95	<input type="checkbox"/>	The German Master Level B @ £9.95	<input type="checkbox"/>
The Spanish Tutor Level A @ £9.95	<input type="checkbox"/>	The Spanish Tutor Level B @ £9.95	<input type="checkbox"/>
ANSWER BACK Quiz (Senior) @ £10.95	<input type="checkbox"/>		

I have a BBC/Electron/Spectrum computer (delete as necessary)

Mr/Ms/Miss

Address

Post code

I enclose a cheque/postal order for £ _____ payable to KOSMOS Software

KOSMOS SOFTWARE

1 Pilgrims Close, Harlington, DUNSTABLE, Beds. LU5 6LX

INCREDIBLE ANIMATION BROUGHT TO YOUR BASIC PROGRAMS

SIMONSOFT SPRITES VERSION TWO



@ £12.95 for the Electron

A 14-FOLD INCREASE IN SPEED (Electron) of your own character designs makes this the FASTEST EVER screen movement seen in Basic programs on the Electron. Amazing animation effects are available at a command, yet no knowledge of machine code is required. This incredible extension to your machine's facilities is RAM based and your whole program can be SAVED/LOADED at the same time as the control coding and sprite images (your character designs). The designs and the control routine need take as little 8600 (1.5K) from the memory space of your machine!

LOOK AT THESE FEATURES:

1. **SPRITE GENERATOR PROGRAMS** to create your own sprite designs. All 16 colours may be used in each design, with characters as small as one pixel or as large as the 24 x 24 pixel SUPERSprite. As you design the sprites they are automatically stored in the machine code control routine so that you can delete the generator program before writing your own Basic.
2. **UPTO 48 SPRITES ON SCREEN** with 12 separate sprite designs, each with 3 independently controlled clones.
3. **INSTANT ANIMATION** with two images in each sprite design. These are switched automatically as the sprite crosses the screen, allowing effects such as hopping frogs, running men, etc.
4. **COLLISION DETECTOR** with a hit flag that is set to the number of any sprite overlapping with the sprite just moved. When the sprites move apart, there is no disruption of the sprite character designs.
5. **ENLARGEMENT FACILITY** of x2, x3, x4, x5 magnification of the normal sprite size! Let your invaders loom out of the screen in 3D effects — or use enlarged sprites throughout your program!
6. **FOUR PRESET FLIGHT PATHS** designed from the generator programs. Each path has 8 definable directions, with up to 255 steps allowed in each direction. Once sprites have been allocated to a path, they will move automatically as your program runs.
7. Both EOR and TRANSFER plotting of sprites to the screen are available.
8. **A SPRITE LIBRARY** of sprite designs ready for use in your programs with 'books' such as 'GHOSTS' and 'MEN'.
9. **SPRITE POSITION COORDINATE VARIABLES** which are reset automatically by the control coding. As you move your designs, the 'old' images left behind are deleted automatically as well.

This amazing package includes control routines containing different combinations of the above features — choose the routine best suited to the program you want to write. A comprehensive colour manual, an introduction program and two arcade style demonstration games are also included in the package. Compatibility with all other Electrons make our animation routines ideal for serious programmers — and we won't claim royalties on programs you market that use sprites!



SUPERFRUIT @ £5.95 for the ELECTRON

Simply the best. Full colour high resolution graphics. Spinning reels with 'bounce'. Incredible gamble effects, hold, 3 types of gamble, swap reels, two-way nudge, nudge gambles, coin pile that shrinks/grows, great sound effects. Separate instruction program. This implementation is in a class of its own.

"You would be fully justified in claiming that it is better than the real thing" — M. Field, Oxford.



ORDERS TO:

**SIMONSOFT, 25 TATHAM ROAD
ABINGDON, OXON OX14 1QB
TEL: 0235 24140**

**PROGRAMMERS — WE PAY 30% ROYALTIES FOR
EXCELLENT PROGRAMS**

Software Surgery

THE COLUMN THAT TAKES A LOOK INSIDE THE LATEST RELEASES

We are amused!

Royal Quiz

Acornsoft/Ivan Berg Software

THERE are few subjects which crop up in conversation more than computers. But one that perhaps does appear just as regularly is royalty in all its forms – people have been fascinated by kings and queens for centuries.

Author Anthony Holden has collected a vast number of facts, both trivial and vital, about royal persons from earliest times to modern day.

These are presented as a series of 30 tests, grouped loosely by subjects as diverse as "The King's Musick" and "1066 and all that", and as intriguing as "The Bad..." and "Verse and Worse".

The difficulty of the questions varies a great deal, but I am sure very few people

would score highly at first.

It is possible to answer individually or to have two teams competing. One drawback, of course, is that by loading the data from cassette it is accessed serially. This can be frustrating.

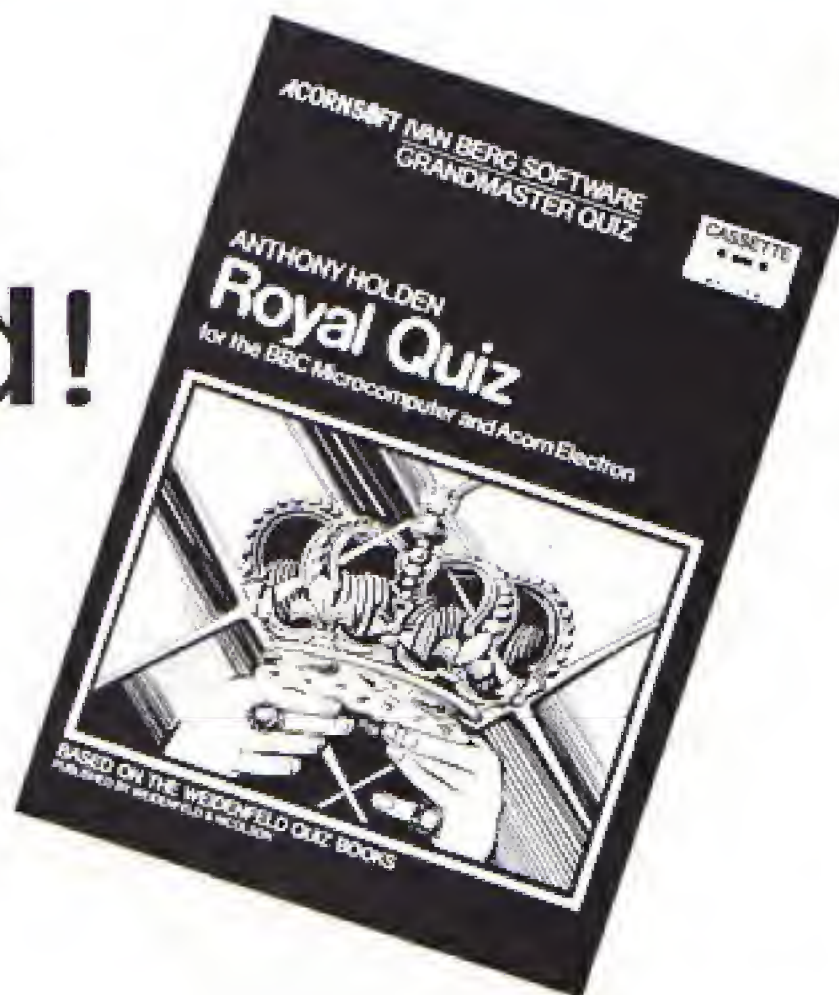
An introductory passage introduces each test, after which the question is posed. The author's answer is then

shown so that marks may be awarded and entered.

This obviously is to prevent an answer such as "Duke of Edinburgh" being disallowed if the built-in answer was "Prince Philip".

I found this program quite fascinating, addictive and educational. It is also a welcome antidote to zapping aliens.

Phil Tayler



Adventure with a difference

Wheel of Fortune
Epic Software

THIS is yet another superb adventure from Epic but one with a difference. For it includes multiple statement commands and characters you can talk to!

One day you find a wheel with the words *Spin me and I'll tell you true, what the future holds for you* written on the hub.

When you spin the wheel you lose consciousness and, on awakening, glimpse a beggar disappearing into the distance with the wheel clutched under his arm.

You soon realise you are in a new and mysterious world. Your task is to recover the wheel and use it to return to your own world. Of course, on the way you collect as much

Creepy-crawly capers

Bugs

Virgin Games

JUST when you thought it was safe to go out onto the lawn and sunbathe, along comes Bugs from Virgin Games.

All is not well in the garden. You are being overrun by an army of marauding bugs.

All you have to repel them with is your trusty bug-blasting spray can, your fast reactions and quick wits.

The bugs start at the top of the screen, slowly working their way nearer and nearer to where you are at the bottom. Don't concentrate on them too much or you'll miss the spider that bounces along, just waiting to gobble you up.

You can jump upwards or sideways to avoid it, but it's a persistent little beast – always there when you least expect it.

And that's not all. Watch out for the harmless looking little snail crossing the screen. He may look sweet but that trail he's laying can stop you

hitting the other bugs.

Also the scorpion that crosses the screen leaves a trail of deadly stings waiting just for you.

The instructions, both on screen and on the pack, are clear and simple, as is the keyboard layout. The sound is very good and the graphics are excellent.

Fast, funny and addictive, it's a very good game for the younger Electron buffs. That's if their parents will let them have a go.

Bev Friend



From Page 19

treasure as you can carry.

You start your quest above ground where you discover some of the novel features of this adventure.

The characters you meet move completely – well almost completely – independently of you or your actions. You find that you can talk to them and sometimes even get a helpful reply!

A useful keyword not usually found in adventures is CONTINUE, abbreviated to C. This moves you as far as is possible in a given direction or repeats a given action. For instance, E, C, means East, Continue.

I considered the adventure to be harder than previous ones from Epic, though this could be because of the added difficulty brought in by having to talk to the characters and to time your moves to coincide with theirs (hint!).

I shan't give too much away though making peace with the beggar is an absolute must if you want to progress.

I must confess I haven't managed to get very far myself. So if you get a fair way through it, or even finish it, please send me some clues!

This is an exciting new adventure with some novel features. It's not for the novice but is excellent value for money for anyone else.

The definitive Electron adventure. Highly recommended.

Merlin

Voyage into the void

Vortex
Software Invasion

ONE of the good things about being a reviewer for *Electron User* is that you get to see and play a lot of the latest games.

The bad thing is that you have to take time off playing them in order to write the review!

It is particularly galling when the game is as good as Vortex, the new 3D space game from Software Invasion.

The program gives you command of five starfighters armed with the almost obligatory laser torpedoes.

Your mission is to enter the black void and hunt down the opposing aliens you find there. At the same time you're trying to survive and the trouble is that aliens aren't all you find in the void.

As you enter the vortex you are pulled forward faster and faster. The enemy craft come at you making you dodge and weave to avoid them.

When they're in range you can have a go at destroying them but they return the compliment, every hit lowering the strength of your shields.

Not that my shields ever ran



out. By then I'd usually crashed into one of my attackers!

And when you've run that gauntlet you meet the real guardians of the vortex, the asteroids that hurtle towards you.

Your weapons are no use in these asteroid storms – your only chance is to dodge. The longer you survive, the further into the void you go and the faster the asteroids come at you.

And if you manage to survive them there are more

aliens waiting to take you on at the other side.

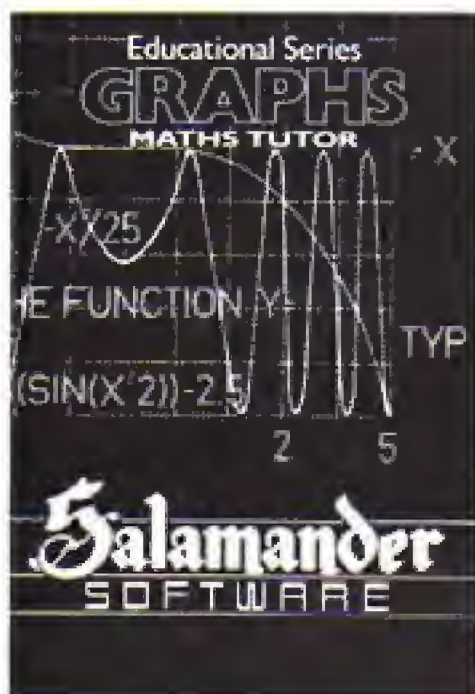
The speed has to be seen, or rather experienced, to be believed. You really do feel as though you are being drawn into the vortex, fighting for survival.

The graphics are excellent – though the sound could be better – and the instructions and keyboard use adequate.

A fast, captivating and amusing program, thoroughly recommended for lovers of action games.

Graham Parr

Plotting that learning curve



Graphs Maths Tutor
Salamander Software

WHEN I was studying O and A level maths there was only one way to produce a graph of a function. That was to mark sufficient points to elicit the shape of the curve.

It was painstaking work and often inaccurate owing to the unsteadiness of my hand.

Micros have now brought about virtual accuracy to this work, but plotting and labelling axes or marking out a grid remains very time-consuming.

This package, however, allows the function to be input, suitable axis limits to be applied and . . . there is your graph, perfectly drawn before your very eyes.

A quick plot feature is also available which uses preset values for the X and Y axes. This allows an approximation to be gained quite easily and quickly.

More advanced graphs make use of parametric expressions, with X and Y both being defined in terms of a third variable. This again is catered for, and the same range of options is available.

All through the most

instructive booklet there is a rich variety of suggestions and questions which will quickly make the potential of this program easily understood.

The second part of the tape provides testing in the shapes of curves, with a multiple-choice format. This again covers an extensive range including trigonometrical functions, straight line curves and quadratic and cubic equations.

Any student from O level to post A level will find this suite of programs an ideal complement to both private study and revision.

Phil Tayler

Use your Electron as a valuable tool for teaching

Happy Letters

Bourne Educational Software

ONE of the points made by many infant teachers about the use of micros is that the keyboard is composed of capital letters, while infant children are more familiar with lower case.

This program has gone a long way towards solving this problem by showing the relationship between the two systems.

It contains a suite of five options which cover matching and identifying letters, with a delightful screen presentation which appealed greatly to the children I tried it on.

Five letters are displayed on one side of the screen, each with a fish lying behind it. Another letter moves slowly down the other side of the screen, pausing next to each of the five.

When the two match, and if the child correctly signifies this by pressing the Return key, the little fish swims across and collects the pair of letters. Then it smiles and swims back to its place.

When the sequence of attempts is over, a beautifully drawn crocodile appears at the bottom of the screen.

Those fish whose answers were correct can swim away, but wrong answers are gobbled up to shrieks of delight. The child making a wrong answer is given another chance, so hopefully most of the fish escape.

The first three options cover matching either lower case letters, lower case words or matching upper/lower cases.

The remaining two options provide necessary practice in finding the letters on the keyboard – a major stumbling block even with 10 or 11 year

olds.

The time delay allowed by the program can be varied, so that the child can be tested against his previous results.

Monitoring the children's scores is done very well indeed. The adult can not only see the scores of each child, but also the incorrect responses made so that problems can be readily identified.

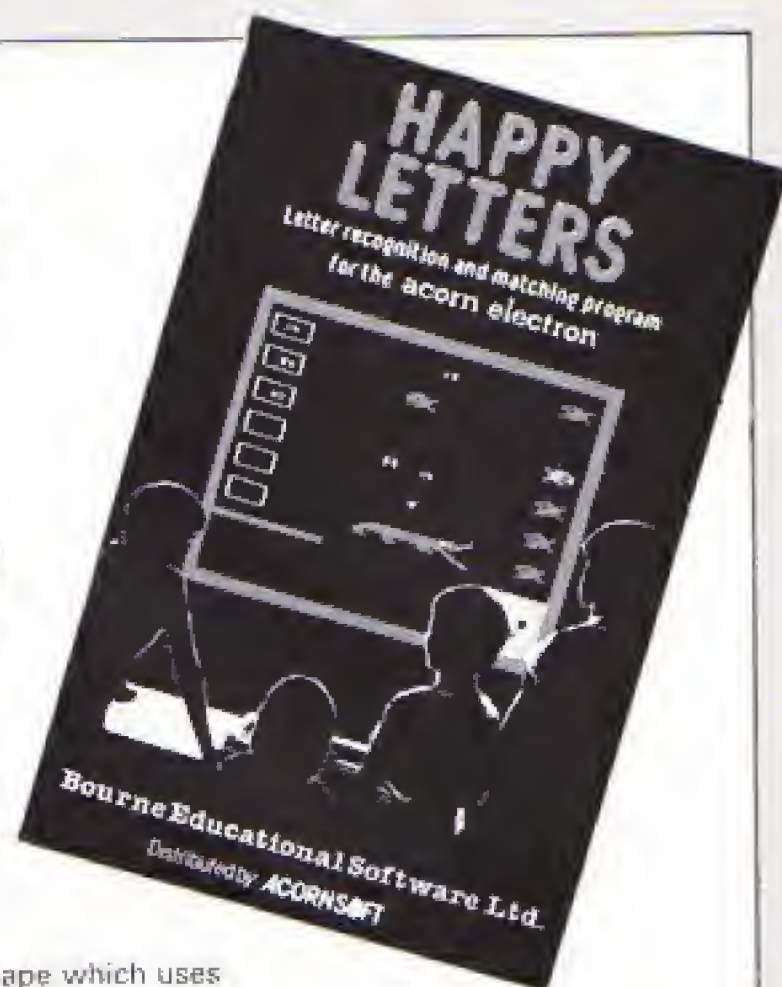
The program is a fine

example of a tape which uses the micro as a valuable tool rather than merely as a gimmick.

Everything about the program seems to have been well

thought out, from variable difficulty levels to an excellent 16 page booklet for parents.

Phil Tayler



IT'S FAST, FURIOUS AND COMPULSIVE!

Electron Invaders

Micro Power

IT'S amazing really. Only four years ago Space Invaders machines were the latest thing, original and compulsive.

I must have spent a fortune on them and still I never learnt how to get the mother ship without being hit myself.

Now, however, the alien invaders no longer hold sway.

Newer and more colourful arcade games have taken over my affections.

Or at least they had until I had a go at Micro Power's Electron Invaders and learnt that the game was as fascinating as ever.

From the moment the familiar rows of aliens started

descending from the top of the screen showering destruction I was hooked again.

At first they looked slow, but that was my mistake. They're as fast as ever and seem to be a lot more cunning.

In an effort to avoid destruction I spent a long time cowering under the three silos, but even that was no use as the invaders have a new weapon.

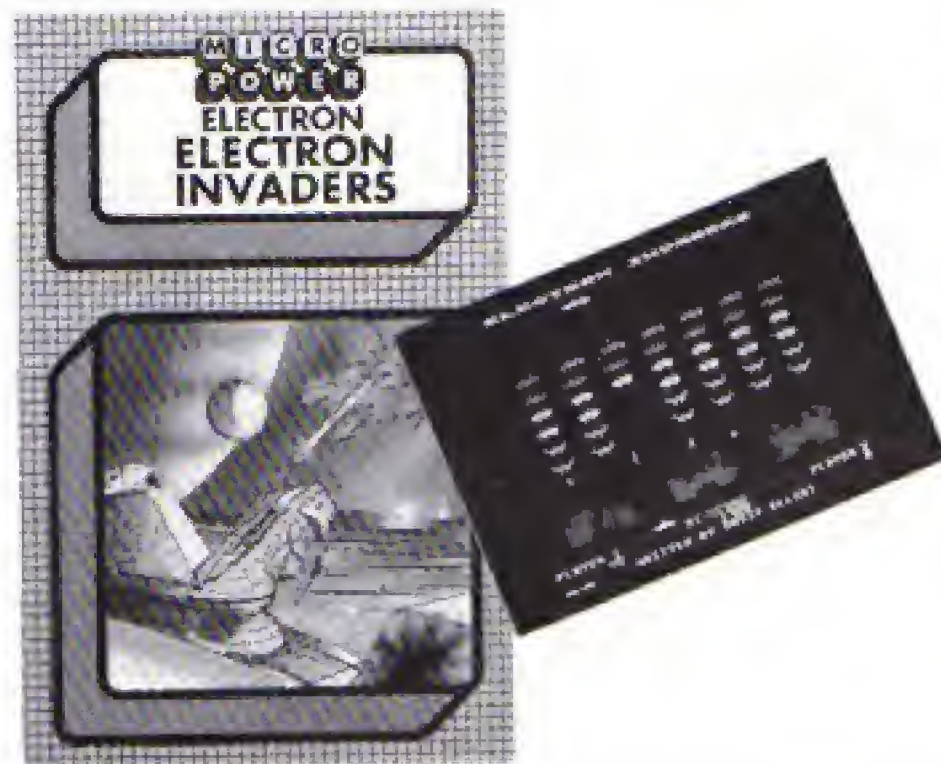
Not content with the usual rain of laser bolts they are dropping fragmentation bombs that can penetrate beneath your silo. This may not be cricket but it certainly adds a new dimension to the game.

The graphics are excellent, the sounds and instructions adequate and the game is as compulsive and frustrating as ever.

If you are an arcade game freak and you're looking for a version of invaders for your Electron then you need look no further.

But watch out for those motherships – they're deadly.

Peter Gray





National Micro

**Everything
on this page
is 5% less
than our
normal price**

**This special
offer is
exclusively for
readers of
Electron User
and applies to
mail order
sales only.**



We will also send you
FREE membership of
NMC's Computer Club –
enabling you to enjoy
generous discounts on all
your future purchases!

Benefits for Club members
include a big saving of
10% on software and 5%
on hardware purchases
over £25.

*Personal shoppers are
welcome at our retail stores:*

**National Micro Centres,
36 St. Petersgate,
Stockport SK7 5NY.
Tel: 061-429 8080**

**Wilmslow Micro Centre,
62 Grove Street,
Wilmslow, Cheshire.
Tel: 0625 530891**

PRINTERS

Now you can add a printer to your Electron, using Plus 1, we have selected four of the most popular dot-matrix printers. All allow you to condense or embolden text, offer high definition characters and allow you to produce clear-cut graphics and charts:

Brother HR5 (30cps)	£170.95
Brother EP22	£170.00
Epson RX80 (100cps)	£272.00
Epson RX80FT (incl. friction feed)	£315.00

For superb correspondence-quality printing you need a daisywheel printer. Our choice is one of our best-sellers, the Silver Reed EX43. It can also be used as a superior standalone electronic typewriter **£394.25**
(Without Electron interface: **£286.90**)

MONITORS

You can happily operate your Electron with your domestic TV set. But more and more users are finding that for a really crisp picture you need a special monitor. We offer a monochrome and three colour monitors:

Zenith 12" (green screen)	£81.00
Microvitec (14" colour – low res)	£217.41
Microvitec (14" colour – med res)	£326.66
Microvitec (14" colour – hi res)	£480.70

For the best of both worlds there is the 14" Nordmende, which can double as a monitor and normal TV, at a very attractive price **£238.00**
(with remote control **£251.00**)

DATA RECORDER

From a wide selection of cassette recorders we recommend the Pye Data Cassette Recorder, which is a perfect match for the Electron. With it comes a FREE power pack and Electron lead.

£38.00

A FREE dust cover with every Electron

We have ample stocks of Electrons and can promise mainland delivery within 24 hours of receiving your order. With it comes an introductory cassette of 15 programs, a very comprehensive User Guide, an easy-to-understand DIY book on programming AND a free dust cover with the compliments of

National Micro Centres **£189.00**

Electron Dust Cover if supplied separately **£2.80**

JOYSTICKS

Use a joystick to play arcade games and watch your score increase dramatically! For serious games a joystick really is a must – and we have two we specially recommend. Both provide twin fire buttons.

Sureshot (self-centering action)	£15.67
Kempston	£12.83



Selling well... First Byte's switched joystick interface

Since it was launched at the Electron & BBC Micro User Show the switched joystick interface from First Byte has been one of our top sellers. This plug-in cartridge takes standard Atari-style joysticks which are much more popular – and cheaper – than analogue joysticks. **£23.70**

Centres

MAIL ORDER DIVISION

Phone
your order
on

061-429 8080

Answering service outside normal office hours
Or use the order form below

AT LAST! Plus 1 is the Electron add-on we've all been waiting for!

ELECTRON PLUS 1 is Acorn's answer to a growing demand from Electron users to be able to extend their micro's capabilities. With it you can add a printer and use your Electron for word processing and financial calculations. Its joystick input is designed to take two fully-proportioned joysticks - giving an entirely new dimension to games playing. And its two unique cartridge slots enable you to plug in games, educational and business programs - and that means no more waiting for programs to load. Many other manufacturers are now planning cartridges that will use Plus 1 to expand the Electron in many more exciting ways and considerably increase its power and versatility.

ELECTRON PLUS 1 is a must for every user who wants to really make the most of his micro.

Incredible
value at **£56.90**

ROM CARTRIDGES

With Plus 1 you can use software cartridges on your Electron for the first time. Acornsoft has produced an initial range of cartridge games, educational and computer language programs, and many more will follow.

DELIVERY CHARGES

Hardware: £7 per item
Software: FREE

**ALL PRICES GIVEN HERE
INCLUDE VAT**

Our Top Ten Best Sellers

Birds of Prey (Romik)

A fast moving invaders type game where the aliens in space take the form of birds. Great value for money. **£6.99**

Pharaoh's Tomb (A & F)

Seek the golden mask in this graphic adventure, solve anagrams and number puzzles - but avoid the monsters. **£7.15**

Killer Gorilla (Micropower)

Fast becoming a cult game. Dodge tumbling barrels and blazing fireballs. Gripping multi-level action. **£7.95**

Twin Kingdom Valley (Bug-Byte)

A sophisticated adventure game with all 175 locations drawn in full-screen hi-res graphics. **£8.55**

Cylon Attack (A & F)

"Outstanding... quite simply excellent... the graphics leave most other games standing" - *Electron User* **£7.15**

Chess (Acornsoft)

One of the best computer versions of the game, easy to use, with more options than its competitors. **£8.28**

Felix in the Factory (Micro Power)

Never a dull moment for Felix, left in charge of the factory one evening. A great fun program. **£7.15**

Snapper (Acornsoft)

Gobble dots and fruit as you're chased round the maze by bog-eyed meanies. A real classic. **£8.28**

Starship Command (Acornsoft)

Guide your craft through deep space and avoid an enemy bent on your destruction. Very addictive. **£8.28**

Chuckie Egg (A & F)

A progressive game requiring extremely high skill levels. The nightmare has begun! **£7.90**

ORDER FORM

Post to:
NATIONAL MICRO CENTRES,
36 St. Petersgate,
Stockport SK1 1HL

Item	Please supply the following	Qty	Total	
			£	p
.....
.....
.....
.....
.....
.....
.....

Attractive credit terms
Phone for details

Carriage
TOTAL

Please indicate method of payment.

- ☐ Cheque payable to
National Micro Centres
- ☐ Access/Barclaycard No.
.....

Name
Address

Tel. No.
Signed EU

MICROPOWERMICROPOWERMICROPOWERMICROPOWER

SIX FANTASTIC PROGRAMS FOR THE ELECTRON!

MICRO POWER STRIKE AGAIN!



↓ DANGER UXB £7.95

Run or slide from block to block to defuse the time-bombs before they explode. Avoid the deadly Skulls as you collect the flags for extra points. Features a special bonus sheet and Stomping Boots option.



POSITRON £6.95 ↓

Only the quickest can survive in this superfast 'zap-em' game requiring superior reflexes. Missiles pour from the skies as you attempt to repel the ruthless invaders from NGC 891. Features eight types of enemy craft.

MICROPOWERMICROPOWERMICROPOWERMICROPOWER



ADVENTURE £7.95

Explore the tortuous forests, dark caverns, and castle dungeons to rescue the Princess and carry off untold treasures. Use skill and imagination to visit over 100 locations and solve the baffling puzzles. An intriguing and frustrating text-only adventure.

INTERGALACTIC TRADER £8.95

Beat the competition to Orion with valuable ore mined from your string of asteroids and become a multi-millionaire. Determination and cunning are required to stay ahead of the field in this exciting strategy game for 1 to 9 players. Complete with a comprehensive manual.



ELECTRON INVADERS £7.95

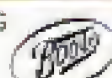
Leave the safety of the bunkers to fire at the Delerian attack force flying overhead. Take careful aim between the craft to obliterate the orbiting mothership. But watch out for the bombs which explode in mid-air and spray the area with shrapnel.



GALACTIC COMMANDER £7.95

Land with precision at the nine different Xenon bases to receive the ultimate accolade. Features underground landing sites and an eventual encounter with the dreaded Floops.

AVAILABLE FROM ALL GOOD DEALERS INCLUDING
BOOTS JOHN MENZIES AND WH SMITH

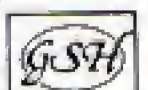


Other top titles for the Electron include:
Killer Gorbis £7.95/Bendits at 3 o'Clock £6.95/Moonrider £7.95/Croaker £7.95/
Felix in the Factory £7.95/Felix and the Fruit Monsters £7.95/Chess £7.95/Draw £9.95/
Escape from Moonbase Alpha £7.95/Cybertron Mission £7.95/Swoop £7.95.

All Electron programs (except Electron Invaders) are also available for the BBC Micro.

Written any programs? We pay 20% royalties!

P & P 55p per order



Showrooms:
MICRO POWER LTD.,
Northwood House,
North Street,
Leeds LS7 2AA.
Tel: (0532) 468800.

Mail Order:
MICRO POWER LTD.,
8/Ba Regent Street,
Leeds LS7 4PE.
Tel: (0532) 683186/696343.

SPECIAL OFFER

Deduct £1 per cassette
when ordering two or more

ANSWER BACK SENIOR QUIZ GENERAL KNOWLEDGE

*THE ULTIMATE EDUCATIONAL QUIZ
FOR AGES 12 & OVER*

BBC (32K)-ELECTRON

The ANSWER BACK Quiz provides an incredible adventure in education by combining a compelling Space-Age game with an immense series of questions on General Knowledge. The thought-provoking and well-researched quizzes contain an enormous total of 750 questions with 3000 answer options covering the following subjects:

☐ Astronomy ☐ Music ☐ Natural History ☐ Famous People ☐ Science ☐ Sport
☐ History ☐ Art and Architecture ☐ Know your Language ☐ Discoveries and
Inventions ☐ Legends and Mythology ☐ Geography ☐ Literature
☐ Films, TV and Theatre ☐ Pot Luck

The highly sophisticated control program rewards each correct answer with another turn in the colourful, animated game.

FEATURES INCLUDE

☐ Multiple choice answers ☐ True or False? ☐ Find the missing letters
☐ 'Pass' facility ☐ Immediate correction of errors ☐ Timer option
☐ Performance summary ☐ Re-run of questions passed or incorrectly
answered ☐ Full facilities for creating and saving an unlimited number of new
quizzes

Available from your computer store or by mail order Price £10.95.

AVAILABLE SHORTLY:
ANSWER BACK
Junior Quiz
for the under 11's



Other
educational titles include...
"The French Mistress"
"The German Master"
"The Spanish Tutor"



The ANSWER BACK Senior Quiz will educate and fascinate ANYONE over 11 years old

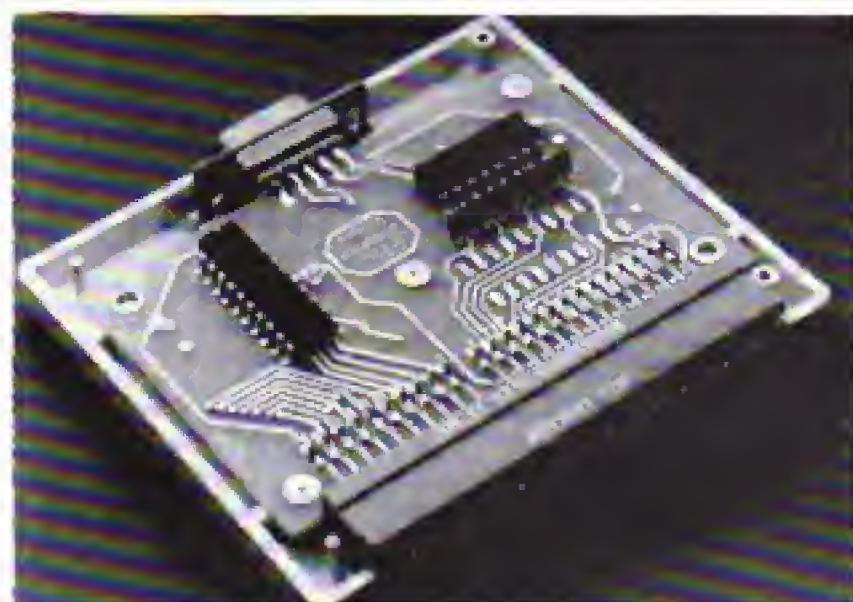
KOSMOS SOFTWARE, 1 Pilgrims Close, Harlington, DUNSTABLE Beds LU5 6LX.
Please send me the ANSWER BACK Senior Quiz for the BBC/ELECTRON
computer
Mr/Mrs/Miss _____

Address _____

Post code _____

I enclose a cheque/postal order for £10.95 payable to KOSMOS Software

HARDWARE REVIEW



WHETHER you bought your Electron for games, graphics, education or just the joys of programming, the fact is a joystick is an invaluable addition to your system.

Once you've used one you'll never want to be without it again.

The trouble is that the basic, unexpanded Electron doesn't support joysticks, so you first need an interface.

First Byte's joystick interface is one of several that have recently come onto the market.

A small beige coloured box that matches the Electron, the interface slots neatly onto the rear edge connector at the back of the computer.

It lies flush with the work surface, rendering it very secure. Because it doesn't interfere with the normal keyboard operation of the computer, it can be left connected at all times.

The manufacturers claim that the casing is specifically designed to protect the expansion bus connector. I'll take their word for it, as I can't think of any way of testing it without destroying my Electron! Certainly it looks sturdy enough.

Like the Signpoint Interface reviewed last month, it uses "Atari-style" switched 9 pin joysticks.

With the hardware comes a cassette-based program which allows you to convert most commercial programs for use with joysticks, although it should be pointed out this isn't a permanent change to the game.

Enterprisingly, First Byte has managed to persuade most of the leading software houses to support the inter-

Go faster with a joystick

face in its games software. This should mean few future compatibility problems.

The instructions supplied, although perhaps a little too brief, are well written and easy to understand, and tell you how to change your own masterpieces to joystick operation by means of the short program printed on the box.

Another advantage, although undocumented on the package, is that the Electron is able to read and respond to the joystick slightly faster than it is to the keyboard.

This has obvious advantages, especially for games programs.

A minor complaint is the positioning of the joystick socket on the far side of the unit.

This makes for some slight difficulty in inserting the joystick plug when the interface is in place, although the fact that such a minor point was noticeable says a lot for the overall satisfactory nature of the unit.

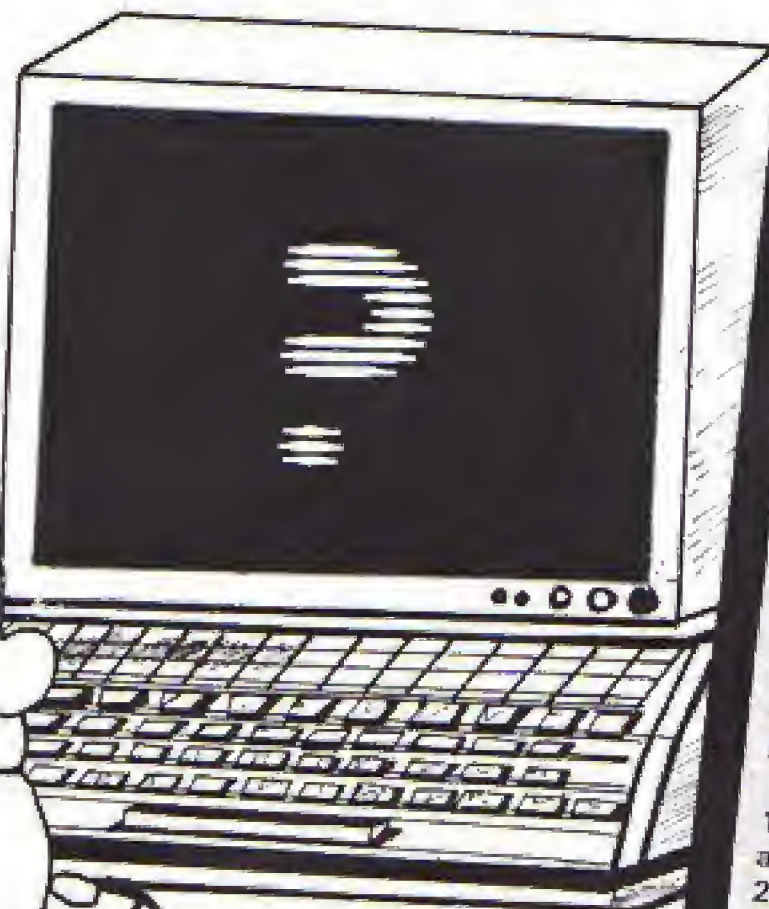
All in all, this is a splendid piece of equipment which I would not hesitate to recommend, despite the slightly high price of £25.

For your money you are getting a piece of hardware which is simple to use, easy to program, and which has endless possibilities beyond blasting aliens.

Andrew Oldham

guess the word

By PETE DAVIDSON



IN Guess The Word, your Electron will think of a word and it's then up to you to guess what it is.

You start with a score of 10. If you have no idea what the word is, pressing Return will display another one of its letters, but loses you points.

You don't lose points for wrong guesses, but you do for guesses that are the wrong length.

You're not stuck with the words we give you. You can put your own in the DATA lines at the end of the program.

But remember that the computer will automatically take the first third of the list as easy, the next third as medium, and the last third as hard.

If you want more than 100 words total, you must also change the DIM in line 250.

VARIABLES

AS	Answer to questions
A%	Average score
C%	Choice
D	Dummy
G\$	Your guess
G%	Number of tries
L\$	Letter being given to you
N%	Number of words
P%	Position of letter in W\$
RS	Letters remaining
R%	Running total score
S%	Score
T%	Tab position
W\$(1%)	Array of words
W\$	Selected word

PROCEDURES

200 PROCINSTRUCT	Prints out the instructions.
240 PROCINIT	Initialises the variables and reads in the words.
330 PROCSELECT	You enter your option (easy, medium, hard) and this procedure selects a word from the appropriate third of the data. It then prints the correct number of dashes on the screen.
430 PROCENTER	Takes in your guess of the word.
480 PROCLETTER	Selects a letter (if requested) and prints it in the appropriate position.
550 PROCHECK	Checks your guess against the selected word.
610 PROCDISPLAY	Prints your score and average at the top of the screen.
650 PROCSCORE	Prints out the score details at the end of the game.

Select the level
that you require.

1...easy

2...medium

3...hard

Press 1, 2, or 3

Guess the Word listing

From Page 27

```

10 REM GUESS THE WORD
20 REM (c) ELECTRON USER
30 REM BY PETE DAVIDSON
40 MODE 6
   :VDU 23,1;0;0;0;0
50 PROCINSTRUCT
60 MODE 2
   :VDU 23,1;0;0;0;0
70 PROCINIT
80 IX=0
   :SX=10
90 REPEAT
100 PROCSELECT
110 REPEAT
120 PROCDISPLAY
130 PROCENTER
140 UNTIL G$=W$ OR
   LEN (R$)=0 OR SX=0
150 IF LEN (R$)=0 SX=0
160 PROCSCORE
170 COLOUR 5
   :PRINT "" "Do you want
   another"" "go?"
180 A$=GET$
   :IF A$="Y"
   THEN 80
   ELSE IF A$(">")="N"
   THEN 180
190 END
200 DEF PROCINSTRUCT
210 CLS
   :PRINT "SPC (12)" "GUESS
   THE WORD"
211 PRINT "" "A word will
   be chosen at random
   by the"" "computer.""
   " You must try to guess
   the word and keep your
   score as high as possi-
   ble."
212 PRINT "" "You start
   each go with 10 points
   and"" "lose points
   by asking to look
   at"" "letters or enteri-
   ng words of the wrong""
   "length. You do not
   lose points for""
   "sensible guesses."
213 PRINT "" "Bars across
   the top of the screen
   show your score and
   average score"
220 PRINT "" "SPC (12)" "PRESS
   ANY KEY"

```

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter are given on Page 4 of the February issue.

```

   :D=GET
230 ENDPROC
240 DEF PROCINIT
250 DIM W$(200)
260 IX=0
   :AX=0
   :RX=0
   :GX=0
270 REPEAT
280 IX=IX+1
290 READ W$(IX)
300 UNTIL W$(IX)="EOF"
310 NX=IX-1
320 ENDPROC
330 DEF PROCSELECT
340 CLS
   :COLOUR 3
   :PRINT "" "Select
   the level"" "that
   you require."
350 COLOUR 2
   :PRINT "" "1...easy""
   "2...medium"" "3...har-
   d"
   :COLOUR 1
   :PRINT "" "Press 1,
   2, or 3"
360 CX=GET -48
370 IF CX<1 OR CX>3
   THEN 360
380 W$=W$(AND(NX/3)+(CX-1)+
   NX/3)
390 R$=W$
400 TX=(18-LEN (W$))/2
410 CLS
   :COLOUR 4
   :PRINT TAB(TX,11)
   STRING$(LEN (W$),"-")
420 ENDPROC
430 DEF PROCENTER
440 COLOUR 5
   :PRINT TAB(0,19)"Type
   in the word and""
   "press RETURN or just""
   "press RETURN to""
   "see another letter."
   TAB(TX,13);
450 COLOUR 6

```

```

   :INPUT "" "G$
460 IF G$=""
   THEN PROCLETTER
   ELSE PROCHECK
470 ENDPROC
480 DEF PROCLETTER
490 IF LEN (R$)=1 PX=1
   ELSE PX=RND(LEN (R$))
500 L$=MID$(R$,PX,1)
510 R$=LEFT$(R$,PX-1)+
   MID$(R$,PX+1)
520 SX=SX-2
530 COLOUR 2
   :PRINT TAB(TX+INSTR(W$
   ,L$)-1,9)L$
540 ENDPROC
550 DEF PROCHECK
560 IF LEN (W$)<>LEN (G$)
   THEN COLOUR 3
   :PRINT TAB(0,19)"Don't
   be silly!" "SPC (45)
   "The word is not "
   STR$ (LEN (G$))
   SPC (43)"letters long"
   SPC (100)
   :D=INKEY (100)
   :SX=SX-2
570 IF W$<>G$
   THEN COLOUR 2
   :PRINT TAB(0,19)"Wrong.
   ....."" "Try
   again" "SPC (140)
   :D=INKEY (200)
580 IF W$=G$
   THEN COLOUR 2
   :PRINT TAB(0,19)"CORREC-
   T...WELL DONE!"
   SPC (180)
   :D=INKEY (200)
590 PRINT TAB(0,13)
   SPC (20)
600 ENDPROC
610 DEF PROCDISPLAY
620 COLOUR 3
   :PRINT TAB(0,0)"SCORE
   "STR$ (SX) "SPC (2)
   :COLOUR 13;

```

```

   :PRINT SPC (SX);
   :COLOUR 128
   :PRINT SPC (20-SX)
630 COLOUR 1
   :PRINT "AVERAGE SCORE
   "STR$ (AX) "SPC (2)
   :COLOUR 129
   :PRINT SPC (AX);
   :COLOUR 128
   :PRINT SPC (20-AX)
640 ENDPROC
650 DEF PROCSCORE
660 IF SX<0 SX=0
   ELSE RX=RX+SX
670 GX=GX+1
680 AX=RX/GX
690 CLS
   :COLOUR 6
   :PRINT TAB(3,8)"SCORE
   SUMMARY"
700 COLOUR 3
   :PRINT "" "YOU SCORED
   "STR$ (SX)
   :IF SX=0
   THEN COLOUR 5
   :PRINT "" "IT WAS "W$
710 COLOUR 1
   :PRINT "" "AN AVERAGE
   OF "STR$ (AX)
720 PRINT "" "AFTER "
   STR$ (GX) " GO";
   :IF GX>1 PRINT "ES"
730 ENDPROC
1000 REM EASY WORDS
1010 DATA NEST,LEAF,ART
   ,THEY,SOOT,LARK,SETT
   ,LAST,GOAL,APPLE
2000 REM MEDIUM WORDS
2010 DATA MEDIUM,HUMOUR
   ,PLASTIC,LAUNDRY,CRICKE-
   T,SENTENCE,MINERAL
   ,COMMENCE,EMERGENCY
   ,TEMPER
3000 REM HARD WORDS
3010 DATA UNGUINOUS,LARYNGEA-
   L,ZYMURGY,OLEASTER
   ,SEMIOLOGY,HYDROPSY
   ,BETATRON,PYRALIDIO
   ,ONDOMETER,CRYOSCOPY
10000 DATA EOF

```

This listing is included in this month's cassette tape offer. See order form on Page 34.

If you miss Mode 7's ability to produce double height characters take a tip from W. JOHN WOOLLARD and ...

LET YOUR TEXT WALK TALL

UNTIL the arrival of my Electron last November I was totally content with the Mode 7 of the school's BBC Micro for all my programs.

In my field of education – teaching less able pupils – my programs were mainly based on reading and comprehension skills.

Mode 7 offered enough graphics to make the programs visually appealing. It also offered double height characters – a most important factor.

Unfortunately Acorn did not think Mode 7 to be as important and treasured as did many of its users. So those of us with Electrons are forced to solve the problems of writing text to double height in other modes.

We needed an easy to use procedure called by PROCdblp(x,y,a\$) where x and y represent the TAB positions of the string to be printed in double height, and a\$ contains the string.

In Mode 7 the procedure was simply a single line as shown in Program I:

```
10 REM PROGRAM I
20 REM Double Height
30 MODE 7
40 PROCdblp(3,3,"Double
   Height Mode 7")
50 END
60 DEF PROCdblp(x,y,a$)
70 PRINT TAB(x,y)CHR$(141a$
   $TAB(x,y+1)CHR$(141a$
90 ENDPROC
```

Program I

It's simple, but not available on the Electron.

The solution to printing in double height in the other modes is to print two characters, one above the other, which together form the complete letter/symbol.

Unfortunately in the text only modes, 3 and 6, there is a

space between each line of text that cannot be used. Those lines are immediately apparent if one changes the background logic colour using a line such as:

```
10 MODE6:VDU19,128,4,0,0,0,
```

In those two modes double height characters are not possible without an annoying gap between the upper and lower halves. However this still leaves us modes 0, 1, 2, 4 and 5.

The next stage is to discover a quick method of creating a single character to represent the top of a letter and a single character to represent the lower half of a letter.

The solution is found on Page 240 of the Electron User Guide. The OSWORD call with A% set to 10 reads character definitions and returns them to memory locations determined by the values of X% and Y%.

All characters are represented by an 8 x 8 matrix of pixels. This matrix is in turn represented by 8 bytes of data, one for the top line, one for the next, and so on to the bottom line.

For example the letter "a" CHR\$(97) is represented by 0,0,60,6,62,102,62,0. This should be familiar to anyone

who has read Casting Agency in *Electron User*.

This works out as shown in Figure 1:



Figure 1

Any character can be redefined using VDU23. To define CHR\$(255) so that it appears as a letter "a" you use:

```
VDU 23,255,0,0,60,
   6,62,102,62,0
```

where the final eight numbers are the matrix values starting at the top line.

Using OSWORD A% = 10 and VDU23 together the following algorithm, of which Program II is the Basic version, was devised:

- Send the string to be printed.
- Take each character of the string in turn.
- Analyse the character matrix using OSWORD with

```
10 REM PROGRAM II
20 REM Double Height
30 MODE 1
40 PROCdblp(3,3,"ELECTRON
   USER")
50 END
60 DEF PROCdblp(x,y,a$)
70 LOCAL K
80 FOR K=1 TO LEN(a$)
90 ?&70=ASC(MID$(a$,
   K))
100 A%=10
110 X%=&70
120 Y%=0
130 CALL &FFF1
140 VDU 23,255,&71,&71
   ,&72,&72,&73,&73
   ,&74,&74
150 PRINT TAB(x+K,y)
   CHR$(255)
160 VDU 23,255,&75,&75
   ,&76,&76,&77,&77
   ,&78,&78
170 PRINT TAB(x+K,y+1)
   CHR$(255)
180 NEXT
190 ENDPROC
```

Program II

A% = 10.

- Set CHR\$(255) to represent the top half and PRINT.

From Page 29

- Set CHR\$(255) to represent the lower half and PRINT.
- Repeat for each character of the string.

Program II can then be reduced to VDU statements to save space, as shown in the listing for Program III.

Alternatively, to save variable space and speed things up, the x and y can be made into integers $x\%$ and $y\%$ or resident integers such as $M\%$ and $N\%$. However this means that the procedure cannot be reduced below two lines.

Program IV is a machine code version which runs considerably faster. The string is analysed in a similar way but a CALL statement is used to analyse each character and PRINT it on the screen.

The CALLED machine code subroutine must be initialised at the start of the program.

That need not be the end of the story. The procedure can be developed to include error trapping and extended to include triple and quadruple height characters.

Now let all your text walk tall!

```

10 REM PROGRAM III
20 REM Double Height
30 MODE 1
40 PROCdblp(3,3,"Double
   Height")
50 END
60 DEF PROCdblp(x,y,a$)
70 LOCAL K
80 FOR K=1 TO LEN (a$)
90 ?&70=ASC (MID$(a$
   ,K))
100 AX=10
110 CALL &FFF1
120 VDU 23,255,?&71,?&71
   ,?&72,?&72,?&73,?&73
   ,?&74,?&74,31,x+K-1
   ,y,255,23,255,?&75
   ,?&75,?&76,?&76,?&77
   ,?&77,?&78,?&78,31
   ,x+K-1,y+1,255
130 NEXT
140 ENDPROC

```

Program III

10 REM PROGRAM IV	:JSR&FFEE	:LDA#255	:LDA#79
15 REM Double Height	:LDA#255	:JSR&FFEE	:JSR&FFEE
20 MODE 1	:JSR&FFEE	:LDA#7A	:ADC#1
30 PROCinit	:LDA#71	:ADC#1	:JSR&FFEE
40 PROCdblp(3,3,"MACHINE	:JSR&FFEE	:LDA#255	:LDA#255
CODE")	:JSR&FFEE	:JSR&FFEE	:JSR&FFEE
50 END	:LDA#72	:LDA#75	:RTS
60 DEF PROCinit	:JSR&FFEE	:JSR&FFEE	:J
:DIM dblp &FF	:LDA#73	:JSR&FFEE	:NEXT
:FOR Opt=0 TO 2STEP 2	:JSR&FFEE	:LDA#76	:ENDPROC
:PX=dblp	:JSR&FFEE	:JSR&FFEE	
:OPT Opt	:LDA#74	:JSR&FFEE	110 DEF PROCdblp(x,y,a\$)
:STA#70	:JSR&FFEE	:LDA#77	:LOCAL K
:STX#79	:JSR&FFEE	:JSR&FFEE	:FOR K=1 TO LEN (a\$)
:STY#7A	:LDA#31	:JSR&FFEE	:AX=ASC (MID\$(a\$,K,1))
:LDA#10	:JSR&FFEE	:LDA#78	:X=X+K-1
:LDX#70	:LDA#79	:JSR&FFEE	:Y=Y
:LDY#0	:JSR&FFEE	:JSR&FFEE	:CALL dblp
:JSR&FFF1	:LDA#7A	:LDA#31	:NEXT
80 LDA#23	:JSR&FFEE	:JSR&FFEE	:ENDPROC

Program IV



THE Impossible Triangle from PHILLIP RASMUSSEN of Cardiff could have you not believing your eyes.

Using the techniques that Mike MacManus covers in this month's Graphics article, the program draws a seemingly impossible triangle.

No doubt this will be the start of a flood of Electron optical illusions!

```

1 MODE 1
2 VDU 19,3,3,0,0,0
3 VDU 19,0,4,0,0,0
4 VDU 23,1,0;0;0;0
5 CLS
10 MOVE 360,780
20 DRAW 440,780
30 DRAW 400,740
40 DRAW 320,740
50 DRAW 360,780
60 MOVE 400,740
70 DRAW 660,400
80 DRAW 706,445
90 DRAW 440,780
100 MOVE 706,445
110 DRAW 745,390
120 DRAW 702,345
130 DRAW 660,400
140 DRAW 62,400
150 DRAW 400,740
160 MOVE 443,692
170 DRAW 196,450
180 MOVE 406,657
190 DRAW 600,400
200 MOVE 560,450
210 DRAW 115,450
220 MOVE 62,400
230 DRAW 98,345
240 DRAW 702,345
250 MOVE 320,740
260 DRAW -20,400
270 DRAW 62,400
280 MOVE 0,400
   :DRAW 0,417
290 MOVE 0,400
300 DRAW 35,347
310 DRAW 90,347
320 MOVE 0,1024
325 PRINT
330 PRINT "An Impossible
   Triangle"
340 REPEAT UNTIL FALSE

```


MORE than a year ago my school joined the hundreds of other primary schools who had already ordered a micro under the Department of Industry's Micros in Primary Schools scheme.

This gave a very limited choice, especially as the county suggested in the strongest terms that we should standardise on the BBC package.

We would have picked the BBC anyway, as it represented far better value for money than either the Research Machines micro or the Spectrum.

We waited (and waited) until the great day came and one of the staff went to collect the system.

The staff of 11 consisted of two with some experience of micros, and nine who had to be convinced that there was any place for the machine in their teaching.

We've had the system now for six months and the ratios have been exactly reversed.

Only two staff still hold reservations about their use of the micro, while the others vary from mildly to very enthusiastic.

This is obviously a very pleasing result, although it produces one major problem which must be repeated all over the country – one micro is almost worse than no micro at all.

It is constantly in such demand that another micro is urgently required. Yet we are not alone in being unable to find the cost of another identical system.

Perhaps the Electron can offer a totally feasible alterna-

Classroom companions

Teacher PHIL TAYLER shows how the Electron is scoring top marks in the primary school

tive, as I hope to show.

I had used my own micros in the classroom for a while, having previously owned a Spectrum and an Oric. I was fortunate to track down an Electron in early December, and was struck with the dearth of software around.

So I investigated the BBC software to see what would actually work on the Electron.

With the BBC Micro came a suite of programs from the Microelectronics Education Programme, all written in Basic and all listable.

The snags were obvious, as much use was made of Mode 7 and its CHR\$ codes, but none was insurmountable.

Many merely call up colours of text or background, double height characters, etc. and this information can be gleaned easily from the BBC manual.

The average programmer can therefore modify the offending lines to produce an acceptable approximation or completely rewrite them.

One trickier problem is that Mode 7 supports all colours with 25 characters a line, while none of the Electron's modes offers an obvious equivalent.

With all the programs converted where necessary we had two parallel systems which were very nearly equal.

Commercial software, however, has proved to be a rather different matter, especially where these are written in machine code.

There has been a welcome move recently towards more programs being made for the Electron or at least being made compatible with both the BBC and Electron.

It is to be hoped that compatibility will be maintained in the future, or perhaps software houses could produce versions for each micro, one on each side of the cassette.

How has the Electron fitted into my class, and others in the school?

Well, as can be seen from the accompanying photographs, it has proved most valuable.

We have, in Essex, a very positive view on the role of micros in primary schools. They should provide a stimulus to a child that the child cannot obtain in any better way.

This has led to a stimulating, open-ended approach to micros with young children, in which much use has been made of a cassette containing a subset of Logo.

Children can design their own patterns, shapes or figures and build them on screen, making any necessary modifications where appropriate.

Good programming habits were encouraged by the use of procedures, parameters and so on.

A snag from the children's point of view was the lack of colour facilities in the Logo tape, so after much thought, I let some of my more able pupils in on a little bit of Basic.

Having described the machine's graphics screen

coordinates, I explained the MOVE and DRAW commands and their syntax.

When someone asked about a solid shape, I explained PLOT 85, and lastly the subject of graphical colours came up so I told them a little about GCOL.

The simple programs designed by the children showed flair and imagination.

There may be many teachers and others reading this whose hands are raised in horror at the prospect of primary children being given any information about Basic.

The truth is that many already know smatterings of Commodore or Sinclair Basic, so perhaps they should know what a well structured Basic looks like!

They were also given just enough information to complete a specific task. The level of discussion and enthusiasm was richly rewarding, and I feel the results more than justified the means.

With a bit of luck, one of the children will enquire about user-defined graphics and animation, which may well lead to another article for *Electron User*.

The Electron has proved itself to be a worthy complement to the BBC Micro, standing up to the robust treatment of five-to-eleven year olds with flying colours.

Its very similar keyboard has helped children to adapt, and the identical Basic has increased its application in the classroom.

Its smaller size has also been a useful feature, being much neater on the computer trolley.

If software firms only appreciate its immense potential, and write compatible programs, then the Electron will surely become the standard choice for a second micro in schools.



The Electron has proved to be the ideal classroom companion for the BBC Micro

Tee-off for a day on the links, but be

FORE!...



FANCY a day on the links? You don't have to go further than your Electron with this version of Golf by **ROLAND WADDILOVE**.

See how many shots it takes you to get round the course. There are bunkers, lakes and lots of rough all waiting for you to tee off.

It's easy to play – all the instructions are in the game. You can go round the course by yourself or have up to four companions playing against you.

So type it in and drive off. But be prepared for a rough time if your game is under par.

PROCEDURES

PROCinitialise

Defines the characters used in the program, and the envelope used. Switches off the cursor keys, auto repeat and Escape. Redefines the Break key.

PROCinstructions

Prints the instructions and shows the characters used.

PROCset-variables

Turns off the cursor, defines a graphics window for the course and sets colours 9-13 to flashing black and white so the ball can be seen on any background. Inputs the number of players and sets up the arrays used. Calls PROCcourse to colour the course green, PROCTrees to draw the trees and PROCfairway to draw the fairway which is made up of small yellow triangles. There is a 1 in 5 chance of calling PROClake to draw a lake. Prints the hole and the flag.

PROCdraw-hole

PROCplay-hole

Sets the start position() for all the players, that are not in the hole or in a hazard so hole()=FALSE, in-hazard()=FALSE. For each player PROCshot is called if not in the hole until all the players are in the hole. Calls PROCinput-direction, PROCinput-distance, PROCcalculate-point to find where the ball lands and PROChit-ball to draw a line to the new position.

PROCshot

PROCinput-direction PROCinput-distance

Must be 1-8.
If in-hazard() then the distance is random up to what you type in.

prepared for a rough time!

NEXT switch on for a game of golf



PROCcalculate-point On direction% GOTO is used to select the correct calculation to work out the ball's new position.

PROChit-ball Draws a line to the new position and calls PROCcheck-position to find out where the ball has landed.

PROCscores Prints out each player's score.

PROCgame-over Restores the auto repeat, cursor keys and Escape.

VARIABLES

players Number of players.

holed() Stores whether a player has holed his ball or not.

shots() How many shots each player has made.

position() x,y coordinates of each player's position.

in-hazard() Stores whether a player is in a hazard or not.

hole Number of hole.

n,i,j Used in loops.

x%,y%,nx%,ny% Temporary x,y coordinates of player's position.

direction% Which way the ball is to be hit. 1-8

distance% How far the ball is to be hit. 1-200

lost-ball Whether a ball is lost or not.

IMPROVEMENTS/MODIFICATIONS

Alter the number of holes played, or add a new procedure PROCnumber-of-holes to ask how many holes you want to play.

Ask whether you want to play again when the game is over.

See whether you can print a flag next to each player's ball when it is his turn, to show where it is.

Golf listing

```
10 REM ** GOLF **
20 REM ** By R.A.Waddilove
   **
30
40 PROCinitialise
50 MODE 2
60 PROCinstructions
70 PROCset_variables
80 FOR hole=1 TO 9
90 PROCdraw_hole
100 PROCplay_hole
110 NEXT hole
120 PROCscores
130 PROCgame_over
140 END
150
160 DEF PROCdraw_hole
170 PROCcourse
180 PROCTrees
190 PROCfairway
200 PROCbunkers
210 IF RND(5)=5
   THEN PROClake
220 COLOUR 131
   : COLOUR 0
230 PRINT TAB(17,33-(j
   DIV 32));CHR$ 226;
240 COLOUR 1
250 PRINT CHR$ 224
260 COLOUR 7
   : COLOUR 128
270 PRINT TAB(7,0);"HOLE
   ";hole
280 SOUND 1,-15,100,10
290 ENDPROC
300
310 DEF PROCcourse
320 COLOUR 130
330 PRINT TAB(0,1);
   SPC (240);SPC (100)
340 ENDPROC
350
360 DEF PROCTrees
370 COLOUR 5
380 FOR i=1 TO 25
390 PRINT TAB(RND(19)
   ,1+RND(16));"*"
```

Turn to Page 55

Make light work of listings

To save your fingers most of the listings in *Electron User* have been put on tape. Seven are now available – for the February, March, April, May, June and July issues, plus a bumper tape of all the programs from the first four introductory issues.

On the July tape:

GOLF A day on the links with your Electron. **SOLITAIRE** The classic solo logic game. **TALL LETTERS** Large characters made simple. **BANK ACCOUNT** Keep track of your money. **CHARTIST** 3D graphs. **FORMULAE** Areas, volumes and angles. **NOTEBOOK** Time table.

On the June tape:

MONEY MAZE Avoid the ghosts to get the cash. **CODE BREAKER** A mastermind is needed to crack the code. **ALIEN** See little green men – the Electron way! **SETUP** Colour commands without tears. **CRYSTALS** Beautiful graphics. **LASER SHOOT OUT** An intergalactic shooting gallery. **SMILER** Have a nice day!

On the May tape:

RALLY DRIVER High speed car control. **SPACE PODS** More aliens to annihilate. **CODER** Secret messages made simple. **FRUIT MACHINE** Spin the wheels to win. **CHASER** Avoid your opponent to survive. **TIC-TAC-TOE** Electron noughts and crosses. **ELECTRON DRAUGHTSMAN** Create and save Electron masterpieces. **SHEEP** A program for insomniacs. **MATHS HIKE** Mental arithmetic. **MESSAGE** VDU commands in action.

On the April tape:

SPACEHIKE A hopping arcade classic. **FRIEZE** Electron wallpaper. **PELICAN** Cross roads safely. **CHESSTIMER** Clock your moves. **ASTEROID** Space is a minefield. **LIMERICK** Automatic rhymes. **ROMAN** Numbers in the ancient way. **BUNNYBLITZ** The Easter program. **DOGDUCK** The classic logic game.

On the March tape:

CHICKEN Let dangerous drivers test your nerve. **COFFEE** A tantalising word game from Down Under. **PARKY'S PERIL** Parky's lost in an invisible maze. **REACTION TIMER** How fast are you? **BRAINTEASER** A puzzling program. **COUNTER** Mental arithmetic can be fun! **PAPER, SCISSORS, STONE** Out-guess your Electron. **CHARACTER GENERATOR** Create shapes with this utility. **FUNNY POLYGONS** Fast graphics going round in circles.

On the February tape:

NUMBER BALANCE Test your powers of mental arithmetic. **CALCULATOR** Make your Electron a calculator. **DOILIES** Multi-coloured patterns galore. **TOWERS OF HANOI** The age old puzzle. **LUNAR LANDER** Test your skill as an astronaut. **POSITRON INVADERS** A version of the old arcade favourite. **MOON RESCUE** Avoid the asteroids and save the spacemen.

On the introductory tape:

ANAGRAM Sort out the jumbled letters. **DOODLE** Multicoloured graphics. **EUROMAP** Test your geography. **KALEIDOSCOPE** Electron graphics run riot. **CAPITALS** New upper case letters. **ROCKET, WHEEL, CANDLE** Three fireworks programs. **BOMBER** Drop the bombs before you crash. **DUCK** Simple animation. **METEORS** Collisions in space. **COMBINATIONS** Crack the code. **BUZZ WORD GENERATOR** Let the Electron help you impress.

HOW TO ORDER

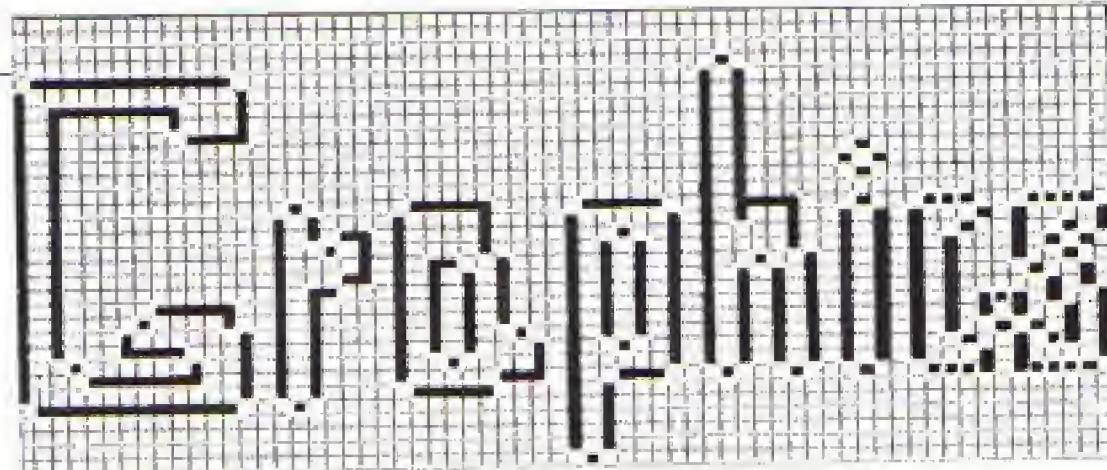
Please send me the following *Electron User* cassette tapes:

Eleven programs from the July issue	£
Ten programs from the June issue	£
Twelve programs from the May issue	£
Eleven programs from the April issue	£
Twelve programs from the March issue	£
Nine programs from the February issue	£
26 programs from the introductory issues	£

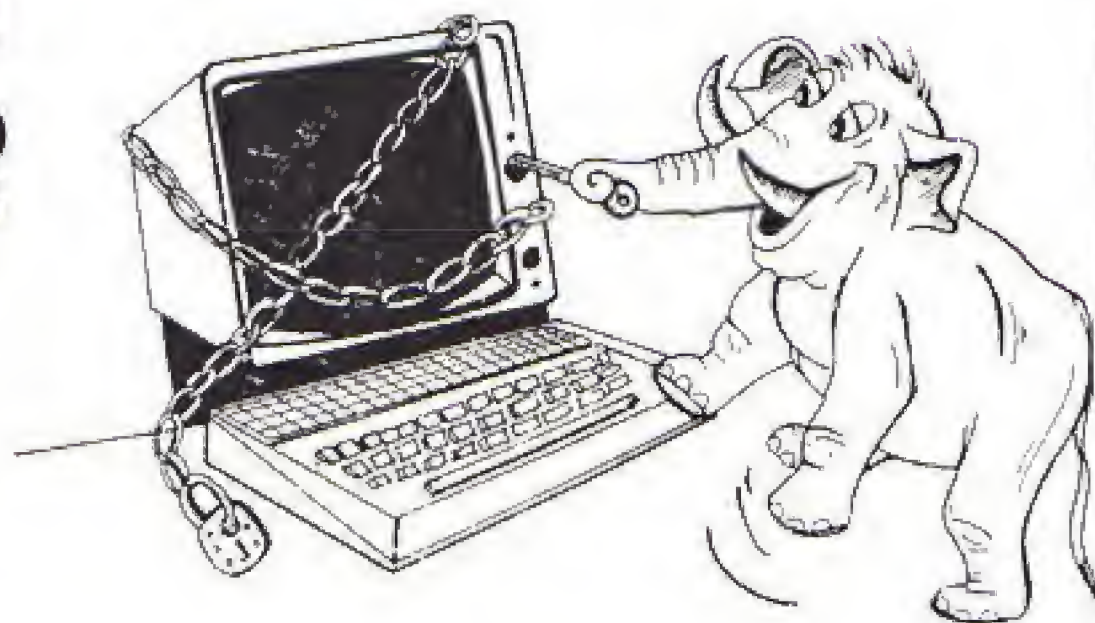
I enclose the sum of £

Name POST TO: Tape Offer,
Address Electron User, Europa House,
68 Chester Road, Hazel Grove,
Stockport SK7 5NY.





UNLOCKING THE POWER OF THE GRAPHICS SCREEN



ALTHOUGH it only seems like yesterday when I started, this is the fifth article on graphics I've written for *Electron User*.

This month we'll be looking at the graphics screen proper and learning how to use three new commands — CLG, MOVE and DRAW.

Before we get down to them, I'd like to just look back over the subjects covered in the earlier articles, a sort of *Story so far*...

The first article, on Page 28 of the February *Electron User*, discussed the seven modes available on the Electron.

We saw that there was a trade off between the number of characters and lines on the screen, the number of colours and the amount of memory used.

For example Mode 6, a two colour mode which has 40 lines of 25 characters each, only uses 8k of memory.

Mode 3, which is exactly the same apart from the fact each line has 80 characters, takes up 16k.

MIKE MACMANUS introduces that elusive little invisible beastie, the graphics cursor

We then explored each of the modes and examined the way letters appeared in each one.

The article that appeared on Page 26 of the March issue took us into the world of computer colour.

We saw that each mode has what are known as default colours. These are the colours used when we enter that mode.

We also learnt how to use the COLOUR command with the logical colour numbers so we could have colours other than the default ones.

Modes 1 and 5 allow us four colours on the screen at once — one of them the background colour — while Mode 2 allow us an amazing 16 colours.

Of course the choice these

modes allow is reflected in the amount of memory used. Mode 2 is very colourful but it does use a lot of memory — leaving less available for our program — and tends to slow things down markedly.

April was a bleak month for *Electron User* as there was no article from me. Still the situation improved in the May issue where, on Page 23, I held forth on actual colour numbers — which I called palette numbers — and the colourful VDU19 statement.

We learnt how you could get any of the 16 available colours from the Electron's palette in any mode. The only restriction was on the total number of colours on the screen at any one time.

Mode 6 would only allow us two colours at once, though by

using a crafty VDU19 we could have any of the 16 available.

We also had a look at the way VDU19 can work backwards in time, by changing colours that are already on the screen.

And May was the month that the elephants appeared!

Page 19 of the June issue, along with an elephant, had us exploring VDU19 in more depth, showing how it could be used to brighten up text displays and even provide simple but effective animation.

As you can see, in just four articles we've come a long way and already your programs should be looking more colourful.

Now, however, I have a confession to make. Despite the fact that this is a series of articles allegedly about graphics, what we've covered so far isn't really graphics at all.

In fact all we've done is to talk about coloured letters and spaces.

What we've covered is

Graphics

From Page 35

what is known as the text screen – so called because it deals with the way letters and words are displayed.

In this article we start our exploration of the graphics screen and the commands that allow you to unlock its power.

For the time being we'll be

content with saying that the graphics screen is exactly the same as the usual TV screen. We can, in fact, vary this but for now we'll just have the normal screen.

Where the graphics screen differs from the text screen we've used until now is the way it is divided up.

Take a look at Figure I. All it

shows is the normal Electron TV screen.

Notice, however, the numbers by its side. They vary from 0 at the bottom left of the screen to 1023 at the top left and 1279 at the bottom right.

You can imagine the whole range of integers from 0 to 1023 and 0 to 1279 ranged along the sides of the screen.

These are what are known as the graphics coordinates. You can use them to accurately pinpoint a position anywhere on the screen.

Figure II shows a point which is roughly in the middle of the screen.

The graphics coordinates for this point are 640,512.

You find the point by going along the bottom of the screen – known as the X axis – until you come to the number 640. Then you go straight upwards until you get to the point that is level with position 512 on the Y axis – the one that goes upwards.

Figure III shows two more points along with their graphics coordinates. You'll notice that the coordinates that position a point are always shown in the form X,Y.

X is the distance the point lies along the X axis while Y, not surprisingly, is the distance along the Y axis.

Now we have a method of locating all the points on the screen what do we do with them?

The answer is we do graphics – and lots of them.

Using the coordinate system and the graphics screen we can unleash all of the Electron's colour graphics power.

However, we have to learn to walk before we can run, so let's start by learning how to draw straight lines.

Unless things have changed a lot since I went to school a straight line is defined as the shortest distance between two points.

You get a straight line on an Electron by giving the micro the coordinates of the two points you want the straight line to join and telling it to get on with it.

The two commands that allow you to do this are the MOVE statement and the DRAW statement. These work on a strange little beastie called the graphics cursor.

We've come across a cursor before. It's that annoying flashing white line which shows where the next letter is going to appear on the screen.

This flashing cursor is the

Figure I:
Graphics
screen
coordinates

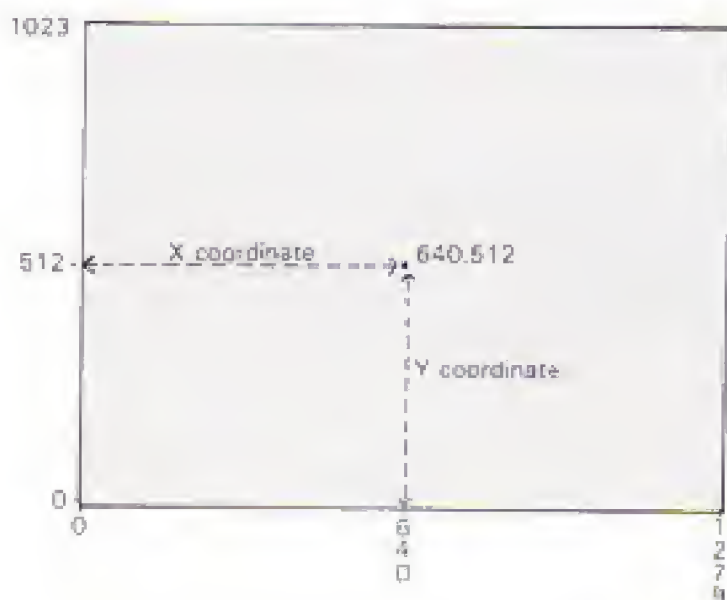
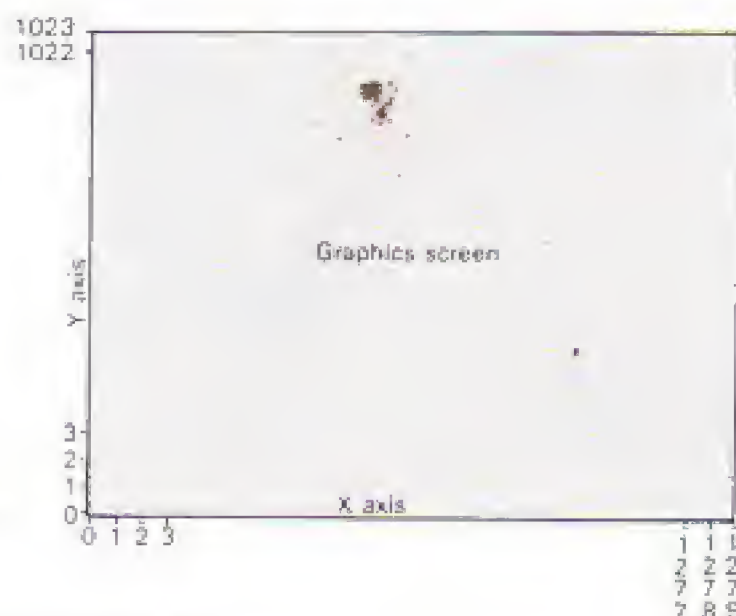


Figure II:
Coordinates
in action

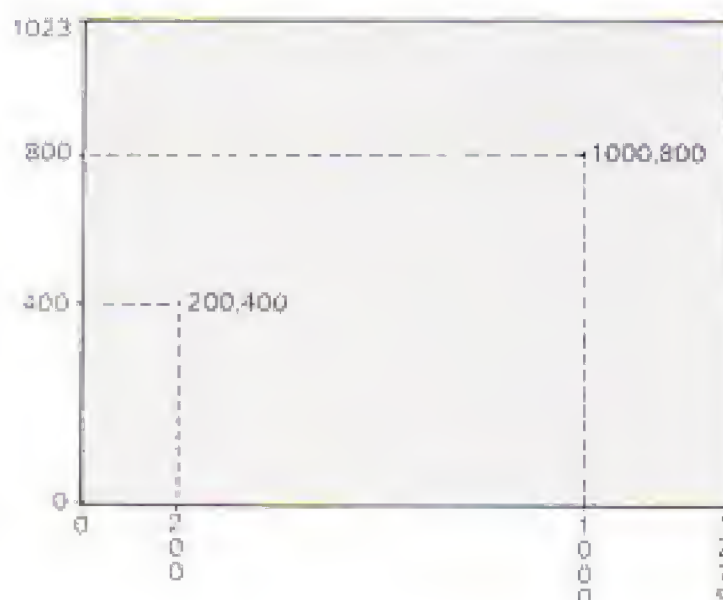
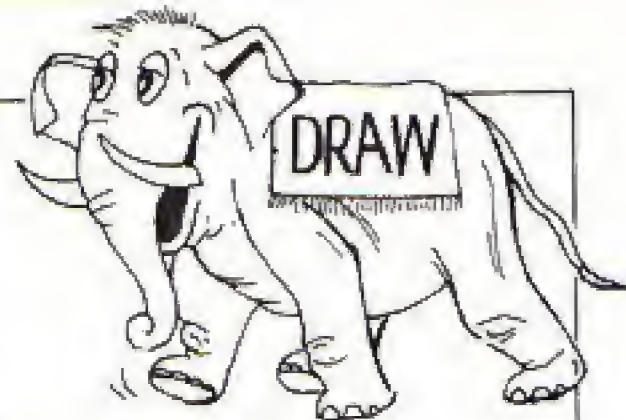


Figure III:
More
coordinates
at work



text cursor, so called because it shows you where the text is going to appear in response to a PRINT or INPUT statement.

The graphics cursor is a different thing altogether. For a start you can't see it, you just have to imagine it.

Also it responds to the graphics commands such as DRAW. And finally it can be located at any one of the 1024 by 1280 locations on the graphics screen.

This makes it a much finer drawing instrument than the text cursor which is restricted to moving along lines and character spaces under the control of the TAB statement.

Don't worry too much about the difference between the two cursors. After a little practice it will become obvious.

I just think of it as the point of a coloured pencil resting on the screen.

Let's get on with drawing the straight line I promised. To do this we just put the Electron in one of the five graphics modes - 0, 1, 2, 4 or 5. Then enter:

DRAW 600,500

and press Return.

This results in a line from the bottom left of the screen to a point near the centre of the screen. This point lies 600 along the X axis and 500 up the Y axis.

But why does the line start at the bottom left of the screen, at the point defined as 0,0 in our coordinate system? Because of the way that DRAW works.

It tells the Electron to draw a line from the last set of coordinates that it used to the point whose coordinates follow the DRAW command.

In the case of:

DRAW 600,500

the Electron hadn't used a set of coordinates previously. In this case it just assumes the previous coordinates were 0,0 and DRAWS the line to 600,500.

Or you could say that the graphics cursor starts at 0,0 and the DRAW command moves it to 600,500, leaving a

straight line on the way. Now you can see why I think of the graphics cursor as the tip of a pencil.

Now enter:

DRAW 800,700

and see what happens. Do you understand why?

What happened is that:

DRAW 800,700

has told the Electron to draw a straight line to 800,700 from the last point mentioned. This was 600,500, so the line joins the two points.

Have a go yourself, using DRAW to create straight lines on the screen. When you get fed up just use CLG to clear the screen.

No, not CLS - that clears the text screen. Use CLG which clears the graphics screen.

At the moment the two coincide so both work equally well, but CLG is the command that specifically erases graphics.

Don't worry if you don't follow that just yet. You will when we come to graphics windows.

You'll notice that so far all the lines we've drawn have been joined together - the last point of one line becomes the first point of the next.

This is all right for doodling but, as you'll find if you try to draw a picture, there are times when you don't want the lines to join up.

You want to give the DRAW command a new starting point. Can you do this?

The answer is that you can, using the MOVE command.

Suppose you have just started up your Electron and you wanted to draw a line from, say, 100,100 to 600,600.

Although you might expect:

DRAW 100,100

followed by:

DRAW 600,600

to do the job, it won't, as you get two lines.

The first, from screen coordinates 0,0 to 100,100, is the one that you don't want. The second, from 100,100 to

600,600, is the one you do want.

The Electron has taken the first point as 0,0 and worked from there. What's happened is that:

DRAW 100,100

tells it to join the point 100,100 to the previous point and hence the unwanted line.

What we should do is to move the graphics cursor to the point where we want the line to start. We do this using the MOVE command.

So, to get the line from 100,100 to 600,600 we just use:

MOVE 100,100

to move the graphics cursor to 100,100 without drawing a line. Then we just use:

DRAW 600,600

as normal to join 600,600 to the previous point - which we've set up with the MOVE.

Try it for yourself, combining DRAW and MOVE to put lines on the screen. After a few minutes you'll find drawing lines on the Electron becomes second nature.

Try writing a few programs using MOVE and DRAW. Program I shows how it's done.

```
10 REM PROGRAM I
20 MODE 1
30 MOVE 500,500
40 DRAW 800,800
50 DRAW 600,300
60 DRAW 500,500
```

All this does is draw a triangle on the screen. Line 30 MOVES the graphics cursor to the starting point, the three DRAW commands producing the lines.

Program II goes on to draw

```
10 REM PROGRAM II
20 MODE 1
30 MOVE 400,800
40 DRAW 800,800
50 DRAW 800,400
60 DRAW 400,400
70 DRAW 400,800
```

a quadrilateral on the screen, using four DRAW commands

to produce the sides.

Program III draws the same shape as Program II but puts the coordinates for the corners of the figure in the DATA statements of lines 80 and 90.

```
10 REM PROGRAM III
20 MODE 1
30 MOVE 400,800
40 REPEAT
50 READ X,Y
60 DRAW X,Y
70 UNTIL X=400 AND Y=800
80 DATA 800,800,800,400
90 DATA 400,400,400,800
```

While it doesn't save much time or memory space in this example, READING coordinates from DATA statements is the best way of producing complicated drawings.

And talking of drawings, let's end with Program IV which draws a ... well, I'll leave it for you to find out. They get everywhere, don't they!

```
10 REM PROGRAM IV
20 MODE 1
30 MOVE 450,200
40 REPEAT
50 READ X,Y
60 DRAW X,Y
70 UNTIL X=450 AND Y=350
80 DATA 400,200,300,300
90 DATA 200,200,150,100
100 DATA 100,100,150,250
110 DATA 250,400,400,550
120 DATA 500,450,575,475
130 DATA 575,250,450,350
140 PRINTTAB(11,19)"*"
150 VDU 23,1,0;0;0;0;
160 REPEAT UNTIL FALSE
```

And that's it for this month. Next time we'll be moving on to drawing coloured lines and graphics windows.

In the meantime I'll leave you with a couple of questions.

Why do the same lines, drawn with the same coordinates, look different in the different graphics modes?

And suppose we give a DRAW command a coordinate such as 1400,1400. As you'll see from Figure 1, this is outside the graphics screen. What happens?

WHAT RESOLUTION FOR ONLY £230. (EX. VAT)



Our RGB high resolution colour monitors (580 × 470 pixels) sell for £229.95 (excluding VAT)—a saving of over £100 compared to other leading monitors of similar specifications.

That's a bargain we guarantee you won't see from any other micro retailer.

We've managed to acquire the sole distribution rights enabling us to offer these superb monitors at this unbeatable price.

And just because you're saving on price doesn't mean you're sacrificing quality. Here's what Personal Computer News had to say about our monitors.

"There is no doubt that the JVC range of ECM colour monitors is excellent value for money...there is no loss in quality of picture after long periods...remember as more and more resolution is available with new micros, the need for a better display will be that much greater."

For those who only require medium resolution we also have a model (370 × 470 pixels) at £179.95 (excluding VAT) which is equally excellent value for money.

Both units have a 14" screen and are suitable for the BBC Micro, Sinclair QL, Lynx, Oric, Apple, IBM, the

Electron and most other leading micros.

And naturally there's a years full guarantee.

Another one of our commitments is to make certain we deliver your monitor by courier within ten days of receiving your order.

You can order by filling in the coupon below and posting to: Opus Supplies Ltd., 158 Camberwell Road, London SE5 0EE. Or by telephoning 01-701 8668 quoting your credit card number. Or, of course, you can buy at our showroom between 9.00–6.00pm, Monday–Friday 9.00–1.30pm, Saturday.

To: Opus Supplies Ltd., 158 Camberwell Road, London SE5 0EE.
Please send me:

- _____ High Resolution Colour Monitor(s) at £229.95 each (ex. VAT)
- _____ Medium Resolution Colour Monitor(s) at £179.95 each (ex. VAT)
- _____ Connection lead(s) at £6.00 each

I understand carriage per monitor will cost an extra £7.00 (N.B. A High Resolution Monitor including VAT, lead and carriage costs £279.95. A Medium Resolution Monitor including VAT, lead and carriage costs £221.89)

I enclose a cheque for £_____. Or please debit my credit card account with the amount of £_____. My Access/B Barclaycard (please tick) no. is _____

Please state the make of your computer _____

Name _____

Address _____

Telephone: _____

Opus.
Opus Supplies Ltd.

MODEL REFERENCE	1302-2 High Resolution	1302-1 Medium Resolution
RESOLUTION	580x470 Pixels	370x470 Pixels
C.R.T.	14"	14"
SUPPLY	220-240v 50/60Hz	220-240v 50/60Hz
E.H.T.	Minimum 19.5kv Maximum 22.5kv	Minimum 19.5kv Maximum 22.5kv
VIDEO BAND WIDTH	10MHz	6MHz
DISPLAY	80 characters by 25 lines	80 characters by 25 lines
SLOT PITCH	0.41mm	0.61mm
INPUT VIDEO	R.G.B. Analogue TTL Input	R.G.B. Analogue TTL Input
SYNC	Separate Sync on R.G.B. Positive or Negative	Separate Sync on R.G.B. Positive or Negative
EXTERNAL CONTROLS	On/off switch and brightness control	On/off switch and brightness control

Plot away to **WIN** a joystick interface

**ELECTRON USER
FREE CONTEST**

TIRED of using your Electron's keyboard to play games? Worried about the effect all your pounding is having on your poor little micro?

Well why not have a go at our free competition? You could win yourself a high quality joystick interface from First Byte Computers.

We're giving away two of them, and the contest couldn't be simpler to enter.

Take a look at the Mike MacManus graphics article in this month's issue and see how he uses the Electron to draw a picture of an elephant.

All you have to do is use the same technique to create your own Electron masterpiece.

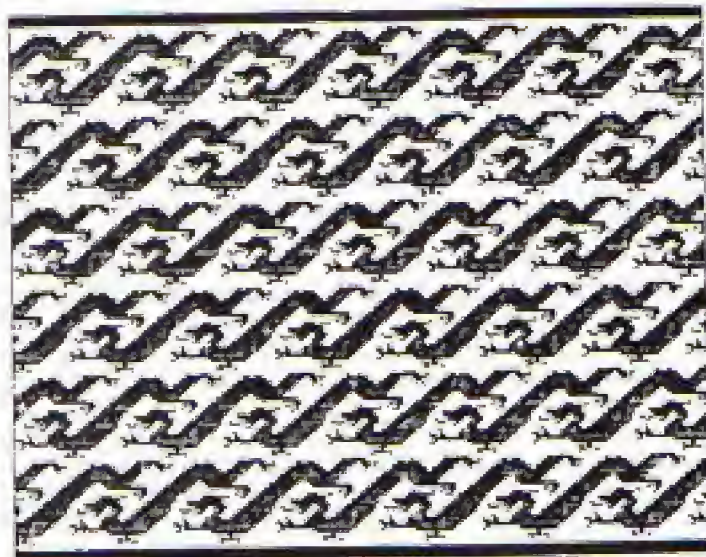
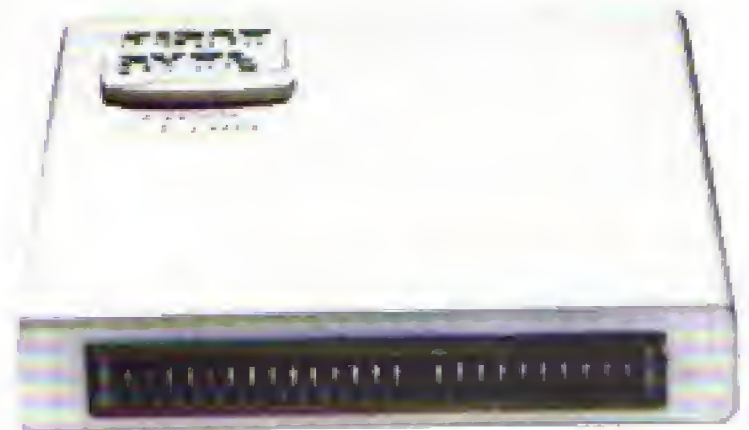
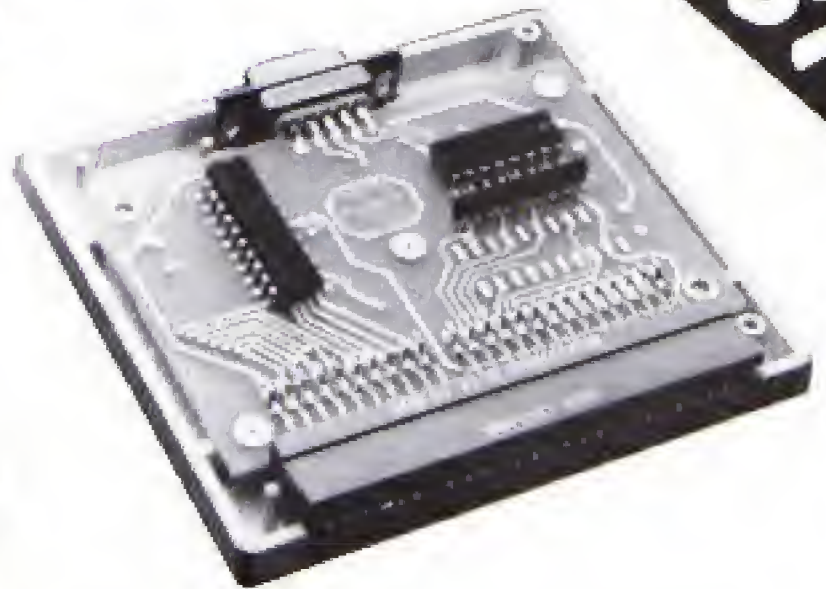
The catch is that you're only allowed to use up to 20 sets of coordinates in the DATA statements, so you'll have to be clever as well as artistic.

When you think you've got a winning picture, write down the coordinates of its points on the coupon below, and send us a sketch of your Electron drawing.

Remember, you can only use 20 points, one after the other.

Entries have to be received by July 31 1984 and the judge's decision will be final.

The two most original, artistic and amusing entries will win the First Byte interfaces.



Dragons grab April prize

REMEMBER in the April issue we asked you to design a frieze using Allen Plume's Frieze program?

The response was fantastic and the decision far from easy. You're a very talented lot!

Eventually we decided on the winner and a SIR Computers printer/ADC interface is on its way to Byrnie Reeds of Washington, Tyne and Wear for her dragons design, which we reproduce on the left.

Electron User contest entry form

Write down your picture's coordinates here:

- | | | | |
|-----|-----|-----|-----|
| 1. | 2. | 3. | 4. |
| 5. | 6. | 7. | 8. |
| 9. | 10. | 11. | 12. |
| 13. | 14. | 15. | 16. |
| 17. | 18. | 19. | 20. |

Don't forget to attach your diagram!

Name _____

Address _____

Send your entry to Drawing, Electron User Contest, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY, to reach us not later than July 31, 1984.

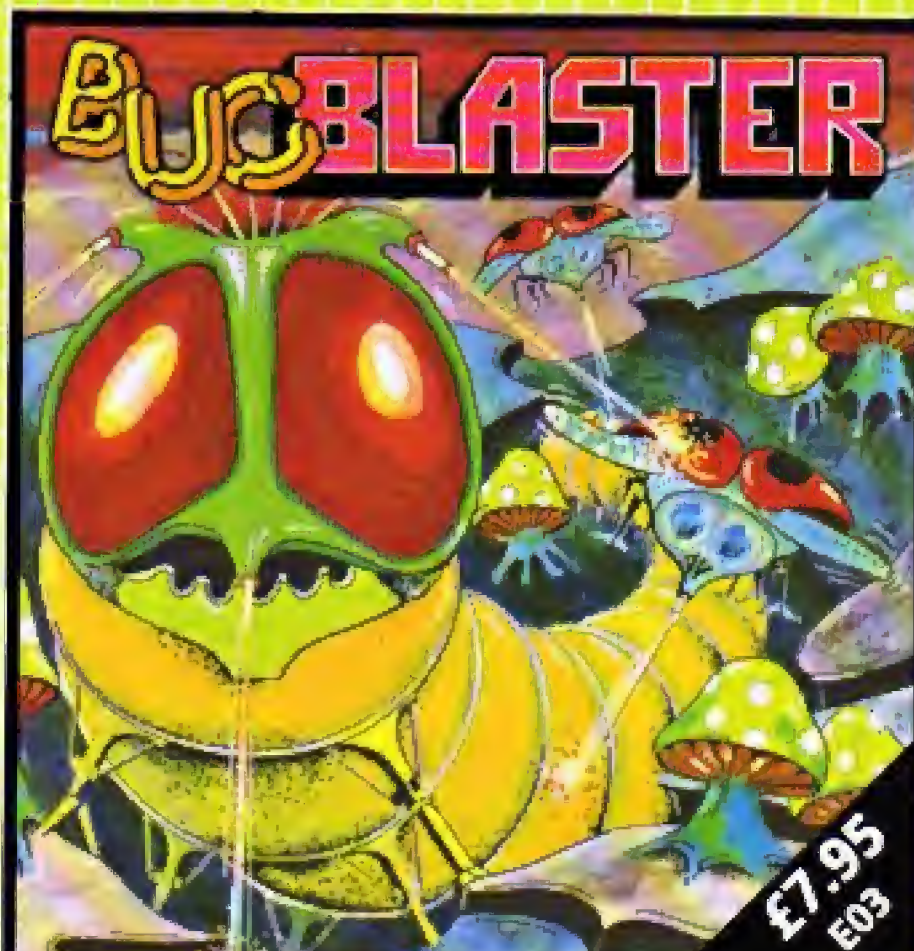
THE GAME TO MAKE
YOUR SKIN
CRAWL

BUGBLASTER

THE ACTION PACKED HIT REWRITTEN FOR ELECTRON

Alligata presents a superb range of software products that are designed specially for you. Games that cleverly combine full machine code and high resolution, full colour graphics to create hours of fun and excitement. And utilities that have been developed to open new doors and help get the best from your Electron micro. If it's to be outstanding quality and amazing value for money then Alligata has to be your choice.

Send a stamped addressed envelope for our full colour catalogue which gives details of the complete range.



A superb action packed arcade special. A really fast implementation of the splendid 'centipede.' Features include spiders, mushrooms, centipedes and the mushroom poisoning scorpion affectionately known as 'Brian.' The better you get the faster the action. Nerve tingling excitement should keep you up all night!

£7.95
E03

Experience all the
speed and
excitement of the
arcade spectacular

WRITE OR PHONE
YOUR ORDER TODAY!

also available from all
good software stockists.

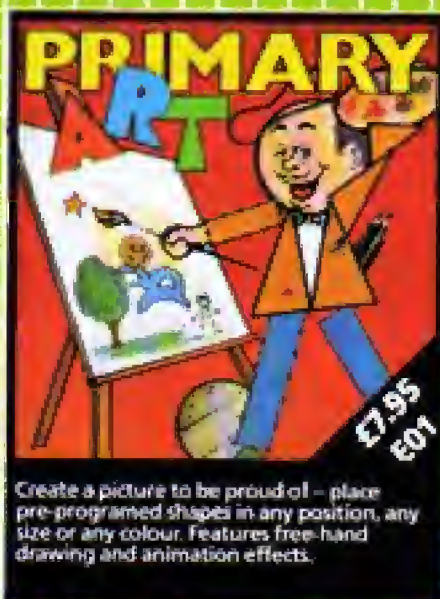
E05 Scribe II £9.95

Produce professional letters and documents, speedily and easily, with this superb word processing program — handling up to 2 A4 pages as one file. Simple to use, yet very powerful, Scribe II handles up to 600 lines of text with 80 characters per line screen display. Compatible with most printers.



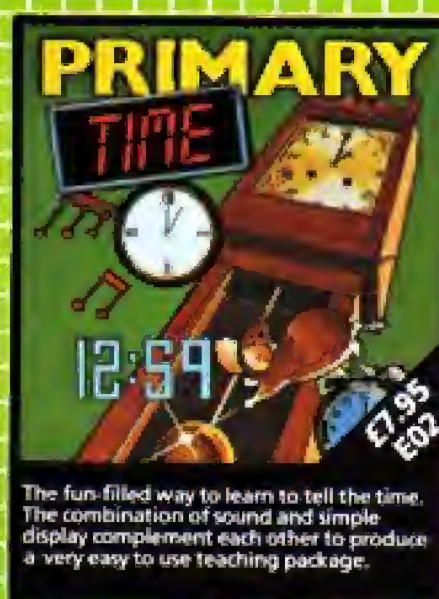
£7.95
E06

Land your moon buggy and rescue a precious cargo, destroying all opposition on the way, finding your way back to the mother ship start again against greater odds.



£7.95
E01

Create a picture to be proud of — place pre-programmed shapes in any position, any size or any colour. Features free-hand drawing and animation effects.



£7.95
E02

The fun-filled way to learn to tell the time. The combination of sound and simple display complement each other to produce a very easy to use teaching package.



£5.95
E04

Keeping your money in your pocket enjoy all the excitement of beating the one arm bandit.



Alligata Software Ltd, 178 West Street,
Sheffield S1 4ET. Tel: (0742) 755005

Despatch is normally made on receipt of order and should reach you within 7 days.

INDICATE PROGRAMS REQUIRED

E03 ☐ E06 ☐ E01 ☐ E02 ☐ E04 ☐ E05 ☐

I enclose cheque/PO* for £_____ Charge my Access/Visa £*_____

Card No. _____ Signature _____

Name _____

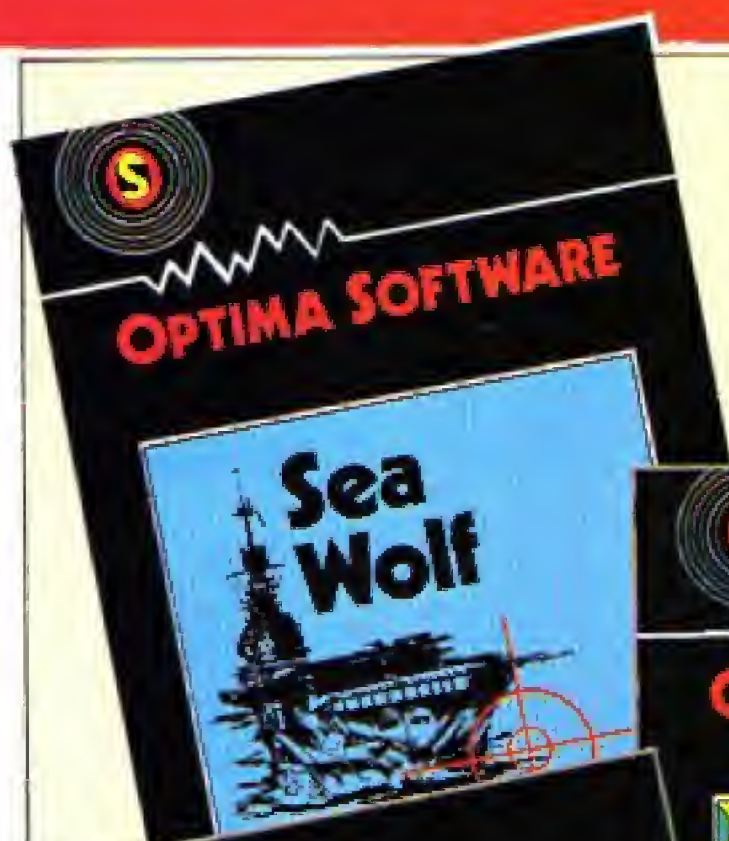
Address _____

*payable to Superior Systems Ltd., 178 West Street, Sheffield S1 4ET.
allow 75p for post and packaging.

OPTIMA SOFTWARE



The games that set the standard



SEA WOLF

So far all has gone well. You have successfully guided your submarine safely through enemy controlled waters and you are beginning to relax.

Suddenly alarm bells scream in your ears – you are under attack!

Desperately you scan the radar screen. Should you try to get him within range of your torpedoes, or attempt evasive tactics? Can you lead your crew to safety?

BED BUGS

The pests are after your feet and you'll have to move fast to stop them. Swot them with a jam sandwich or crunch them with your false teeth.

If you're desperate you can always phone for help. But whatever you do, do it quickly. You need cunning tactics and nimble fingers!

Bed Bugs guarantees hours of hilarity for the whole family.

OMEGA PROBE

Far out in the uncharted reaches of the universe lie the Omega zones from which no man has ever returned.

To explore this hazardous region the Earth's scientists have created the Omega Probe – the ultimate spacecraft.

As pilot of the probe, you face the unknown hazards of the Omega zones. Your mission: to survive.

This fast and furious machine code game with its tremendous graphics and many unique features takes arcade games to new heights of programming excellence.

Get these great games from your Acorn dealer or send off the coupon below to:
Optima Software Ltd, 36 St. Petersgate, Stockport SK1 1HL.

Sea Wolf

- ☐ BBC 'B' cassette £6.95
- ☐ Electron cassette £6.95
- ☐ BBC 40 track disc £8.95
- ☐ BBC 80 track disc £8.95

Bed Bugs

- ☐ BBC 'B' cassette £6.95
- ☐ Electron cassette £6.95
- ☐ BBC 40 track disc £8.95
- ☐ BBC 80 track disc £8.95

Omega Probe

- ☐ BBC 'B' cassette £6.95
- ☐ Electron cassette £6.95
- ☐ BBC 40 track disc £8.95
- ☐ BBC 80 track disc £8.95

☐ I enclose cheque payable to Optima Software Ltd.

☐ I wish to pay by *Access/Visa (*delete as appropriate).

Name _____

Card No. _____

Address _____

Expiry date _____

Signed _____

ELECTRON EDUCATIONAL SOFTWARE

Our educational software is used in thousands of schools and homes throughout Great Britain. Now available on Electron.

EDUCATIONAL 1

£8.00

Hours of fun and learning for children aged 5 to 9 years. Animated graphics will encourage children to enjoy maths, counting, spelling and telling the time. The tape includes MATH1, MATH2, CUBECOUNT, SHAPES, SPELL and CLOCK.

'An excellent mixture of games'

Personal Software - Autumn 1983.

EDUCATIONAL 2

£8.00

Although similar to Educational 1 this tape is more advanced and aimed at 7 to 12 year olds. The tape includes MATH1, MATH2, AREA, MEMORY, CUBECOUNT and SPELL.

FUN WITH NUMBERS

£8.00

This program will teach and test basic counting, addition and subtraction to 4 to 7 year olds. The tape includes COUNTING, ADDING and an arcade type game to exercise addition and subtraction. With sound and visual effects.

FUN WITH WORDS

£8.00

Start your fun with alphabet puzzle, continue your play with VOWELS, learn the difference between THERE and THEIR, have games with SUFFIXES and reward yourself with a game of HANGMAN. Complete with sound and graphics. The tape includes ALPHA, VOWELS, THERE, SUFFIXES and HANGMAN.

'Very good indeed' A&B Computing - Jan/Feb 1984.

JIGSAW AND SLIDING PUZZLES

£7.95

There are 2 jigsaws and 4 sliding puzzles on a 3 x 3 and 4 x 4 grid. Each program starts off at an easy level to ensure initial success but gradually becomes harder. It helps children to develop spatial imagination and in problem solving. The tape includes 6 programs, OBLONG, JIGSAW, HOUSE, NUMBERS, CLOWN and LETTERS.

*** SPECIAL OFFER ***

Buy three cassettes and deduct £4.00

Add 50p per order p&p. Cheque to

GOLEM LTD,

Dept E, 77 Qualitas, Bracknell, Berks RG12 4QG.

Tel. (0344) 50720

For full catalogue write to the above address.

NEW

FOR THE ELECTRON

The latest release from SQUIRREL

TRAFALGAR

Command your own fleet! Battle plan unfolds to sea level view of individual engagements.

Cannonballs smash into hulls and tear holes in sails!

Magazines explode! Ships sink! Fire ships can be sent

downwind! Flags are struck and prizes taken! £8.00

'Totally original new game - best of its type, graphics very watchable'

SOFTWARE SUPERMARKET

The game that all the family can play!

SUPERGOLF

Amazingly realistic - the ball speeds into the air, slows, curves down and rolls. Bunkers, water, 0.0.8., and a

variable gusting wind to cope with! Up to 4 players with

score card for each! £7.50

'I do know a good game when I see one and

Supergolf is just that'

ELECTRON USER

'Left me wanting to play again' MICRO USER


ALL THESE GAMES FEATURE SUPERB MULTICOLOUR GRAPHICS

SQUIRREL SOFTWARE

Dept E,

4 BINDLOSS AVENUE, ECCLES, MANCHESTER M30 0DU

24 Hour answering service - 061-789 4120

Cheques, P.O.s  Programs required. Good royalties paid.



NOW AVAILABLE FOR THE
electron

THE SIR COMPUTERS

PRINTER/SWITCHED JOYSTICK INTERFACE

COMPLETE JOYSTICK & PRINTER FEATURES INCLUDE

JOYSTICK FACILITIES

- Provides connections for two standard Atari-type joysticks, allowing the use of two-player games
- Immediately compatible with all games offering a joystick option
- Extra commands allow joysticks to be defined as any combination of keys, allowing all keyboard-operated games to be used with joysticks
- Joysticks may be read directly from BASIC using the ADVALIN function

PRINTER FACILITIES:

- Provides connections for a standard Centronics-type printer
- Allows use of all BBC Microcomputer printer control commands
- Special command enables a graphics screen to be copied to any Epson dot-matrix printer

ADDITIONAL SPECIFICATIONS:

- Only Acorn-approved memory locations are used, ensuring complete compatibility with any future devices (addways ROM/RAM, sound expansion, speech synthesiser, disc system etc.)
- All operating software is held within a paged ROM and is available for use from the moment the computer is switched on. THERE IS NO NEED TO LOAD ANY ADDITIONAL SOFTWARE FROM CASSETTE.
- Housed in a sturdy plastic case
- Full twelve month guarantee
- Available direct from SIR COMPUTERS for only £44.95 (inc. VAT). POSTAGE & PACKAGING FREE. Please allow 28 days for delivery

SIR COMPUTERS - 1st for electron support

All our prices are inclusive of VAT and postage/packaging.

We also stock a complete range of printers, monitors, disc drives and software - with many hard-to-beat prices. Please telephone us for details.

Access/Barclaycard Telephone orders welcome.

SIR COMPUTERS LTD.

91 Whitchurch Road, Cardiff CF4 3JP. Telephone: Cardiff (0222) 621813



Also available for the Electron

THE SIR ADC/PRINTER INTERFACE

NOT JUST ANOTHER JOYSTICK PORT - FULL

ANALOGUE-TO-DIGITAL CONVERTER provides fully proportional control, essential for use with graphics packages, digitizers, etc. Ideal for scientific & educational applications. Usable with a wide variety of BBC Micro-compatible analogue and switched Joysticks/Paddles.

CENTRONICS PRINTER INTERFACE - allows use of a wide variety of parallel printers including entire Epson range; complete firmware support included.

HIGH QUALITY MOULDED CASE - attractively styled plastic unit bolts securely to the back of the computer

EASY TO FIT - no soldering, simply plugs straight into computer's rear edge-connector and is held in place by twin bolts. edge-connector on back of unit provides for further modular expansion if necessary.

THE SIR ELECTRON PRINTER/ADC INTERFACE £65.95

THE SIR ROM/RAM EXPANSION BOARD

Provides 12 extra sockets which support a variety of ROM and RAM configurations up to a max of 192K for ROM and 16K for RAM.

ROM and RAM is normally paged in 16K blocks but is easily switchable to 2K, 4K or 8K blocks

Easy to install - just plugs in

Professional styled casing bolts to rear of computer

Fully buffered design

Permits use of most BBC ROM-based software including utility ROMs, wordprocessors & languages.

Price: £59.95

DATE	DETAILS OF ENTRY	CURRENT ACCOUNT CHEQUE NUMBER	VALUE £	BALANCE £
PAGE 1				
1.7	SALARY	123456	+1000.00	1000.00
1.7	BILLS	123457	-1010.00	-10.00

How to keep tabs on those cheques

IN these days of ever increasing bank charges it pays to keep an accurate check on your cheque book. This program will help you do just that.

Bank Account is a simplified version of the spreadsheet programs written for much larger machines.

It allows you to keep tabs on your account, update the balance, list all cheque entries together with their numbers and amend any account errors you may find.

After setting mode, error clearance and other instructions in lines 10 to 130, lines 140 and 150 dimension the various arrays used and set up all the variables for the main program.

Lines 160 to 280 contain the main program, successive procedures centred around the entry FOR...NEXT loop allowing 200 entries.

By
**KEN
SMITH**

**Listing starts
on Page 44**

VARIABLES	
Y	The print coordinate.
D(0)	Balance value.
C(0)	Entry value.
A(0)	Debit or credit marker.
E	Entry marker used in FOR...NEXT loop.
Q\$	Cheque number/string.
W\$	Date string.
E\$	Details of entry string.
@%	Decimal place and field width pointer.

PROCEDURES	
PROCh headings	Prints the page headings in the upper text window.
PROCfiles	Checks for the existence of a current datafile.
PROCinputbox	Defines the base text window where the input or messages will appear.
PROCentries	Uses the input box to collect data. Six pieces of information are required: entry details, cheque number, amount, credit or debit, and finally a Return to calculate the new balance.
PROCdisplay	Takes the information entered and displays it in the central text window.
PROCreadtape	Used to input a current datafile.
PROCkeepdata	Used for saving an updated or new account.
PROCstandingorders	Sets the function keys to act as multiple entry keys. The examples given in the program, MORTGAGE and RATE, are typical of the regular monthly outgoings. The one key entry will go through all the usual entry/input instructions in an instant. Lines 1210 and 1220 can be changed as desired. But beware — the layout of a standing orders entry is vital — spaces and all!
PROCreadpages	Allows you to check the previous account pages.
PROCcontinue	Halts the paging for you to check each page carefully.
PROCchange	Allows you to alter an entry. The computer will also adjust, using PROCadjust, all the balances from the altered entry if this is necessary.
PROCmessage	Informs you that you have reached the tenth and final page of the existing account and offers a choice of options.

Bank Account listing

From Page 43

```

10 REM BANK ACCOUNT
20 REM By Ken Smith
30 REM Winscombe, Avon.
40 REM (C) ELECTRON USER
50 MODE 5
   :VDU 23,1,0;0;0;0;
60 PRINT TAB(3,12)"BANK
   ACCOUNT"
70 FOR I=1 TO 3000
   :NEXT
80 PRINT TAB(3,16)"by
   Ken Smith"
90 FOR I=1 TO 3000
   :NEXT
100 MODE 4
   :VDU 23,1,0;0;0;0;
110 *FX11,0
120 ON ERROR GOTO 170
130 *KEY100LDIMRUNIM
140 DIM D(200),C(200)
   ,Q$(200),W$(200),E$(200)
   ,A(200)
150 Y=1
   :D(0)=0
   :Q$=420206
   :C(0)=0
   :E=1
   :A(0)=0
   :B=0
160 REM *** MAIN PROGRAM
   ***
170 PROCstandingorders
180 PROCheadings
190 PROCfiles
200 N=E
210 FOR E=N TO 200
220 PROCinputbox
230 PROCentries
240 PROCdisplay
250 IF E>199
   THEN PROCcontinue
   :PROCmessage
260 IF E>199
   THEN D(0)=D(200)
270 NEXT
280 N=1
   :GOTO 210
290
300 DEF PROCheadings
310 VDU 28,0,4,39,0
320 COLOUR 129
   :CLS
   :COLOUR 0
330 PRINT TAB(11,1)"CURRENT

```

```

   ACCOUNT"
340 PRINT "DATE DETAILS
   CHEQUE VALUE
   BALANCE"
350 PRINT TAB(6);"OF ENTRY"
   :TAB(17);"NUMBER";
   TAB(27);"£"TAB(35);
   "£"
360 ENDPROC
370
380 DEF PROCfiles
390 VDU 28,0,31,39,28
400 COLOUR 129
   :CLS
   :COLOUR 0
410 PRINT "IS THERE A
   DATAFILE IN USE ?"
420 A$=GET$
   :SOUND 1,-15,87,2
   :CLS
430 IF A$="Y"
   THEN PROCreadtape
   :PROCreadpages
   :Y=K
   :ENDPROC
440 IF A$="N"
   THEN ENDPROC
   ELSE 410
450
460 DEF PROCinputbox
470 VDU 28,0,31,39,28
480 COLOUR 129
   :CLS
   :COLOUR 0
490 PRINT "NEXT ENTRY
   (SPACE)"TAB(20);"TO
   READ PAGES (R)"
500 PRINT "TO SAVE DATA

```

```

   (S)"TAB(20);"TO CHANGE
   ENTRY (C)"
510 A$=GET$
   :SOUND 1,-15,87,2
   :CLS
520 IF A$=" "
   THEN ENDPROC
530 IF A$="C"
   THEN PROCchange
   :PROCinputbox
   :ENDPROC
540 IF A$="R"
   THEN PROCreadpages
   :PROCinputbox
   :ENDPROC
550 IF A$="S"
   THEN PROCkeepdata
   ELSE 490
560 PROCinputbox
   :ENDPROC
570
580 DEF PROCentries
590 CLS
600 PRINT "DATE (Max
   5 figures) - then
   RETURN "
   :INPUT W$(E)
   :SOUND 1,-15,120,2
   :CLS
610 IF LEN (W$(E))>5
   THEN 600
620 PRINT "ENTRY (Max
   10 letters) - then
   RETURN "
   :INPUT E$(E)
   :SOUND 1,-15,100,2
   :CLS
630 IF LEN (E$(E))>10

```

```

   THEN 620
640 PRINT "CHEQUE NUMBER
   (Max 6 figures)"
   " then RETURN "
   :INPUT Q$(E)
   :SOUND 1,-15,128,2
   :CLS
650 IF LEN (Q$(E))>6
   THEN 640
660 PRINT "AMOUNT - then
   RETURN "
   :INPUT C(E)
   :SOUND 1,-15,100,2
   :CLS
670 PRINT "CREDIT (C)
   or DEBIT (D) ?"
680 IF W$(E)="" AND E$(E)=
   ""AND Q$(E)=""
   AND C(E)=0.00 AND B=0
   THEN GOTO 220
690 B$=GET$
   :SOUND 1,-15,52,2
700 IF B$="C"
   THEN D(E)=D(E-1)+C(E)
710 IF B$="C"
   THEN A(E)=1
   :GOTO 740
720 IF B$="D"
   THEN D(E)=D(E-1)-C(E)
   ELSE 690
730 IF B$="D"
   THEN A(E)=0
740 CLS
   :PRINT "TO CALCULATE
   BALANCE PRESS RETURN"
   :A$=GET$
   :SOUND 1,-15,120,2
   :CLS

```

DATE	DETAILS OF ENTRY	CHEQUE NUMBER	CURRENT ACCOUNT VALUE £	BALANCE £
1.7	SALARY	123456	+1000.00	
1.7	BILLS	123457	-1010.00	1000.00
				-10.00

NEXT ENTRY (SPACE) TO READ PAGES (R)
TO SAVE DATA (S) TO CHANGE ENTRY (C)

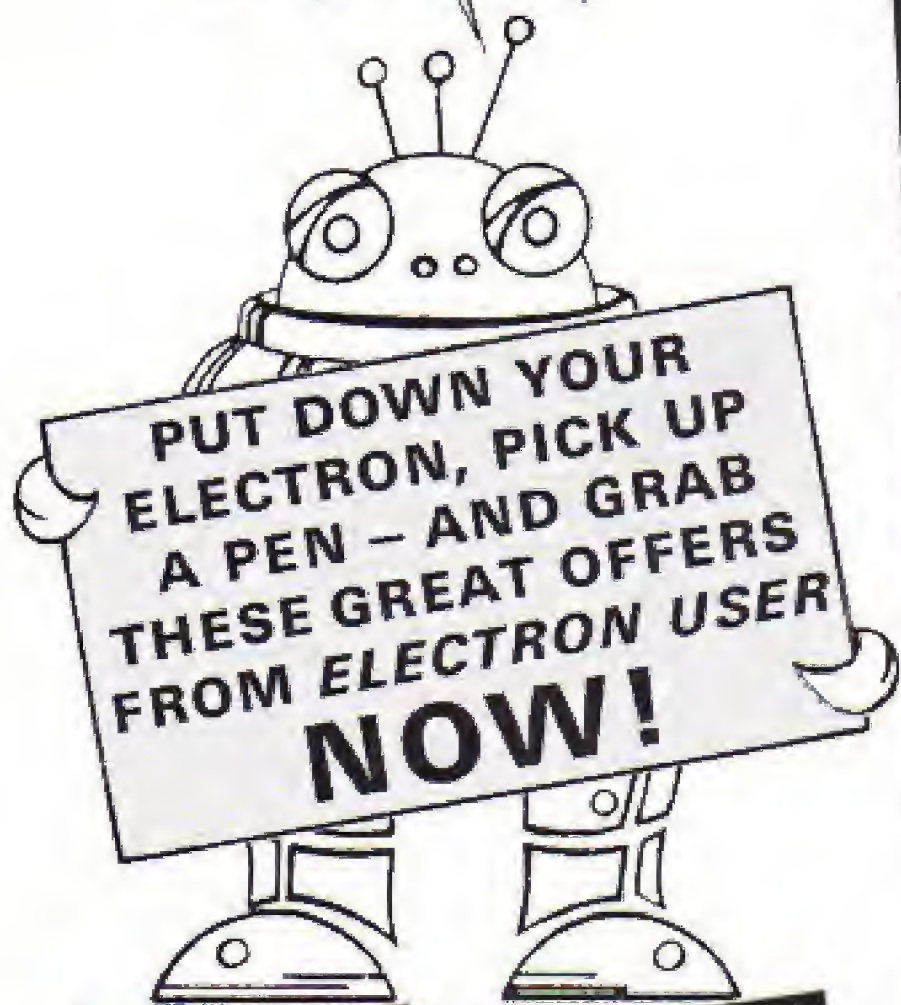

```

750 ENDPROC
760
770 DEF PROCdisplay
780 VDU 28,0,27,39,5
790 COLOUR 128
:COLOUR 1
800 IF Y=1
THEN CLS
810 @X=&00000
:PRINT TAB(17,0)"PAGE
";((E-1) DIV 20)+1
:@X=&20206
820 PRINT TAB(0,Y);W$(E);
TAB(6);E$(E);TAB(17);Q$(E);
TAB(25);C(E)
830 IF A(E)=0
THEN PRINT TAB(24
,Y);"-
ELSE PRINT TAB(24
,Y);"+
840 IF C(E)>999 OR C(E)<-99
9
THEN Y=Y+1
850 PRINT TAB(32,Y);D(E)
860 IF C(E)>999 OR C(E)<-99
9
THEN E=E+1
:D(E)=D(E-1)
:C(E)=0.001
870 IF Y<20
THEN Y=Y+1
:ENDPROC
880 IF Y>19
THEN Y=1
:ENDPROC
890
900 DEF PROCreadtape
910 CLS
:PRINT "ALIGN DATAFILE
TAPE."
920 PRINT "PRESS ANY KEY
WHEN READY."
930 K#=GET$
940 *TAPE
950 X=OPENIN ("BANKDATA")
960 INPUT #X,E
970 FOR S=1 TO E
980 INPUT #X,W$(S),E$(S)
,Q$(S),C(S),D(S),A(S)
990 NEXT
1000 CLOSE #X
1010 CLS
:PRINT "DATA LOADED."
:SOUND 1,-15,87,10
1020 FOR I=1 TO 2500
:NEXT
1030 ENDPROC
1040
1050 DEF PROCkeepdata
1060 CLS
:PRINT "ALIGN DATAFILE
TAPE."
1070 PRINT "PRESS ANY KEY
WHEN READY."
1080 K#=GET$
1090 *TAPE
1100 X=OPENOUT ("BANKDATA")
1110 PRINT #X,E
1120 FOR S=1 TO E
1130 PRINT #X,W$(S),E$(S)
,Q$(S),C(S),D(S),A(S)
1140 NEXT
1150 CLOSE #X
1160 CLS
:PRINT "DATA SAVED."
:SOUND 1,-15,87,10
1170 FOR I=1 TO 2500
:NEXT
1180 ENDPROC
1190
1200 DEF PROCstandingorders
1210 *KEY:MORTGAGE:M IN
150.00:M DIM IN:INSURAN
CE:M IN 20.00:M DIM
1220 *KEY:RATES:M IN 40.00:M
DIM
1230 ENDPROC
1240
1250 DEF PROCreadpages
1260 V=E
:V=1
:K=1
1270 REPEAT
1280 VDU 28,0,31,39,23
1290 COLOUR 129
:CLS
:COLOUR 0
1300 PRINT "TO READ ACCOUNT
PAGES PRESS SPACE."
"TO CHANGE AN ENTRY
PRESS (C)."
1310 A$=GET$
:SOUND 1,-15,87,2
1320 IF A$="C"
THEN PROCchange
:GOTO 1300
1330 IF A$=" "
THEN 1340
ELSE 1300
1340 VDU 28,0,27,39,5
1350 COLOUR 128
:CLS
:COLOUR 1
1360 REPEAT
1370 IF K=1
THEN CLS
1380 @X=&00000
:PRINT TAB(17,0)"PAGE
";((V-2) DIV 20)+1
:@X=&20206
1390 IF C(V)=0.001
THEN GOTO 1440
1400 PRINT TAB(0,K);W$(V);
TAB(6);E$(V);TAB(17);Q$(V);
TAB(25);C(V)
1410 IF A(V)=0
THEN PRINT TAB(24
,K);"-
ELSE PRINT TAB(24
,K);"+
1420 IF C(V)>999 OR C(V)<-99
9
THEN K=K+1
1430 PRINT TAB(32,K);D(V)
1440 K=K+1
:V=V+1
1450 UNTIL K/20 OF V=E
1460 IF V=E
THEN K=1
1470 UNTIL V=E
1480 ENDPROC
1490
1500 DEF PROCcontinue
1510 VDU 28,0,31,39,23
1520 COLOUR 129
:CLS
:COLOUR 0
1530 PRINT "TO CONTINUE
PRESS SPACE."
1540 A$=GET$
:SOUND 1,-15,87,2
1550 IF A$=" "
THEN ENDPROC
ELSE 1540
1560
1570 DEF PROCchange
1580 VDU 28,0,31,39,23
1590 COLOUR 129
:CLS
:COLOUR 0
1600 PRINT "WHICH ENTRY
NUMBER - then RETURN
"
1610 INPUT ;"(EACH PAGE
HAS 20 LINES OF ENTRIES)";H
:SOUND 1,-15,87,2
1620 IF H<1 OR H>200
OR H>E-1
THEN 1590
1630 CLS
:PRINT " TO ENTER
NEW DETAILS PRESS
SPACE."
1640 A$=GET$
:SOUND 1,-15,87,2
1650 M=E
:E=H
:B=1
1660 PROCentries
1670 E=M
:B=0
1680 IF D(H)-D(H+1)<>D(H+1)
OR D(H)+C(H+1)<>D(H+1)
THEN PROCadjust
1690 M=1
:ENDPROC
1700
1710 DEF PROCmessage
1720 VDU 28,0,27,39,6
1730 COLOUR 128
:CLS
:COLOUR 1
1740 PRINT TAB(0,4)"This
is the final page
available in""this
account.""If you
wish to save this
data please""press
(S).""All data excep
t the current balance""
""will be lost otherwise
s."
1750 A$=GET$
:SOUND 1,-15,87,2
1760 IF A$="S"
THEN VDU 28,0,31,39
,23
:PROCkeepdata
:ENDPROC
1770 IF A$="C"
THEN ENDPROC
ELSE 1740
1780
1790 DEF PROCadjust
1800 FOR W=(H+1) TO E
1810 IF A(W)=0
THEN D(W)=D(W-1)+C(W)
1820 IF A(W)=1
THEN D(W)=D(W-1)+C(W)
1830 NEXT
1840 ENDPROC

```

This listing is included in this month's cassette tape offer. See order form on Page 34.

electron user



Be one of the first to get each issue

A subscription will ensure you get your own personal copy **HOT OFF THE PRESSES** month after month for the next year.

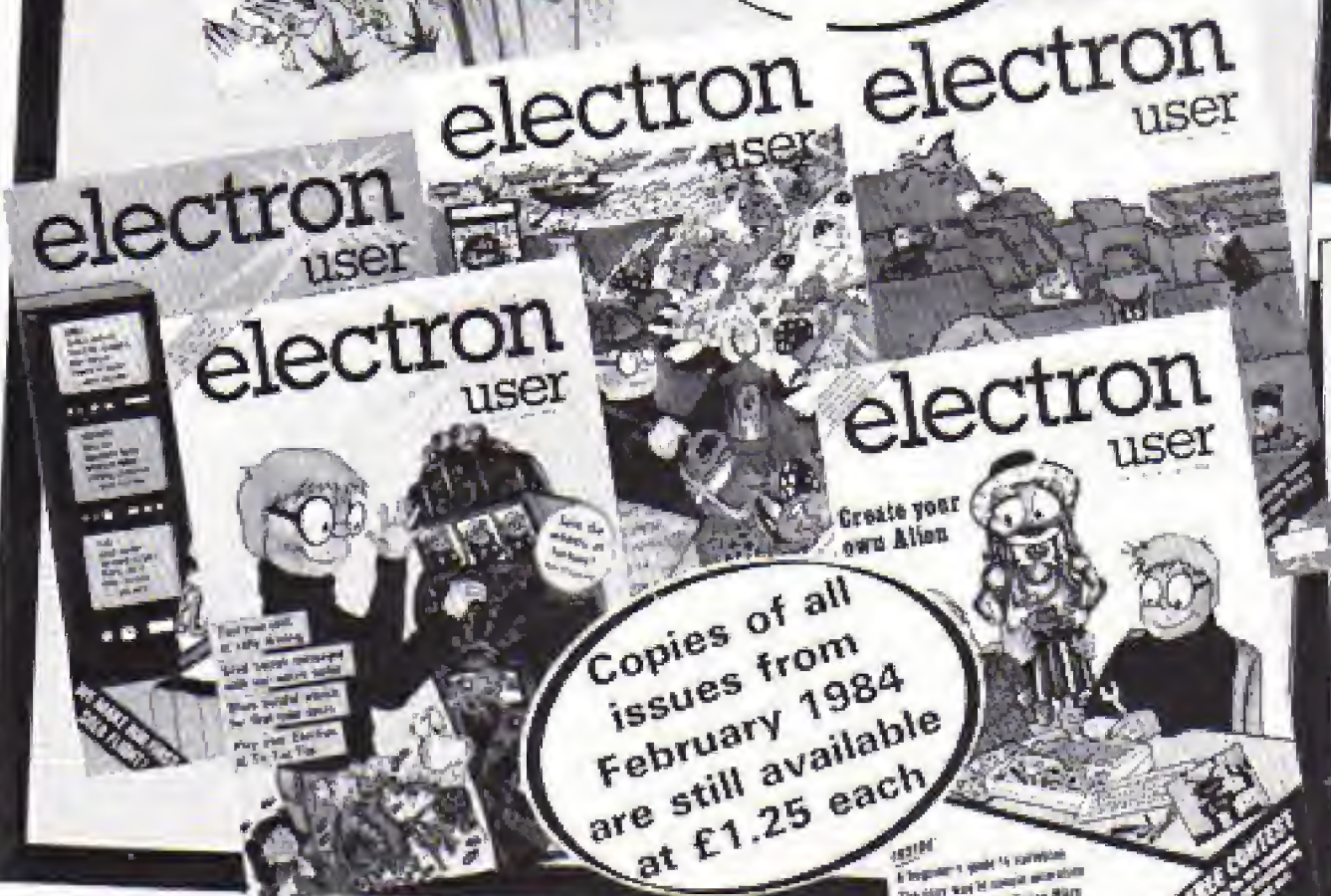
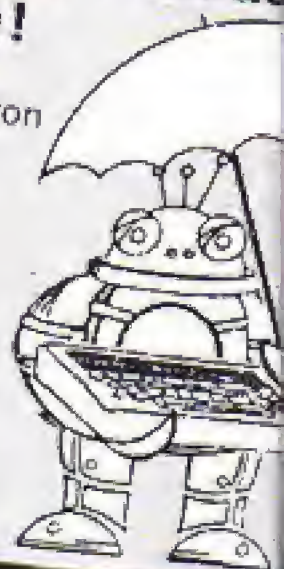
Every owner of an Electron – and everyone thinking of buying one – needs to get *Electron User* every month. It's the brightest, most authoritative yet completely independent guide to a machine that has so much potential you will never tire of reading about its remarkable capabilities.

You can buy *Electron User* from your local newsagent or station bookstall. Or you can take out a 12 months subscription and have it delivered to you by post.



Your Electron needs protecting!

Protect your Electron with our luxury dust cover made of soft pliable water-resistant vinyl, bound with strong cotton and decorated with *Electron User* logo. **£3.95**



Keep your collection of *Electron User* complete with these handsome binders

Bound in attractive red pvc with the *Electron User* logo in gold blocking on the spine, this binder will hold 12 magazines firmly secured in place by metal rods. **£3.95**

FREE

Cassette worth
£3.75 if you
subscribe NOW!

If you take out a subscription to *Electron User* now you will receive completely free one of the monthly cassettes of *Electron User* listings. Choose which one you want from those illustrated below.

This free gift is for a limited period, so subscribe now!

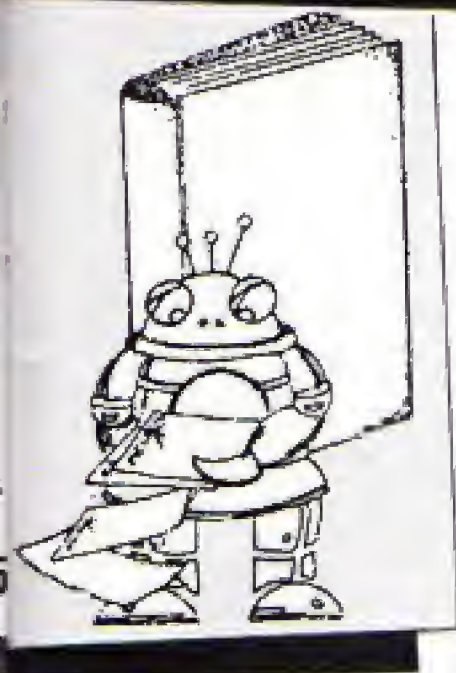
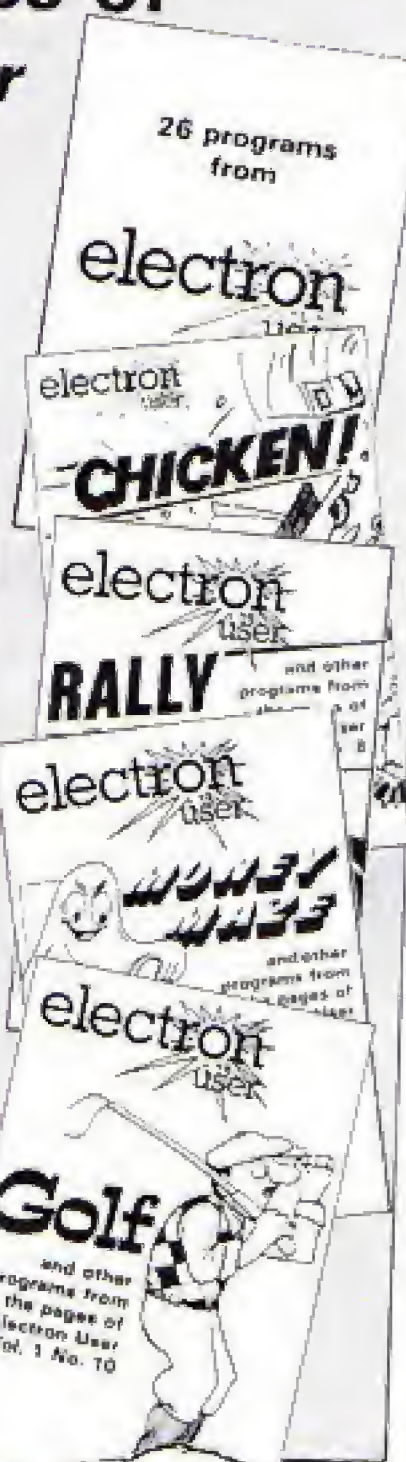
Cassette tapes of *Electron User* programs

Save typing in programs
from *Electron User* by
sending for these
program-packed tapes.

£3.75 each



You can also take out a
subscription for the 12
monthly tapes for £40.



ORDER FORM

All prices include postage, packing and VAT,
and are valid to July 27.

Please enter number required in box £ p

Electron User

annual subscription

UK £12
EIRE £13 (IR £16)
Overseas (Surface) £20
Overseas (Airmail) £40

Selected free cassette _____ (month)

Commence with _____ issue TOTAL _____

Electron User

introductory issues

Complete set of 4

£2.00 UK
£2.25 Overseas (Surface) TOTAL _____

Electron User

back issues

£1.25 UK
February
March
April
May
June

Airmail prices on application TOTAL _____

Electron User

tapes

£3.75 (UK & Overseas)
26 introductory programs
Lunar Lander February
Chicken March
Spacehike April
Rally Driver May
Money Maze June
Golf July
TOTAL _____

Cassette tape

annual subscription

£40 (UK & Overseas)
Commence with _____ tape (state month) TOTAL _____

Dust Cover

£3.95 (UK & Overseas)
TOTAL _____

Binder

£3.95 UK
£5.00 Overseas TOTAL _____

Payment: please indicate method (✓) TOTAL _____

☐ Access/Mastercharge/Eurocard
☐ Barclaycard/Visa
☐ American Express

Card No. _____

Expiry Date _____

☐ Cheque/PO made payable to Database Publications Ltd

Name _____

Address _____

Signed _____

Send to: *Electron User*, FREEPOST, Europa House,
68 Chester Road, Hazel Grove, Stockport SK7 5NY.

(No stamp needed if posted in UK) Please allow 28 days for delivery

You can also order by phone

Telephone:
061-480 0171

24 hours

Don't forget to quote your credit card number
and give your full address

Casting Agency



OIL TANKER

From Jason Owens,
Batley, W. Yorkshire

VDU 23, 225, 127, 113, 117,
113, 127, 127, 26, 8
VDU 23, 226, 255, 95, 95,
79, 255, 255, 3, 1
VDU 23, 227, 48, 72, 72,
124, 124, 252, 128, 0



LOCO AND TENDER

From L. and B. Holgate,
Deeping St. James

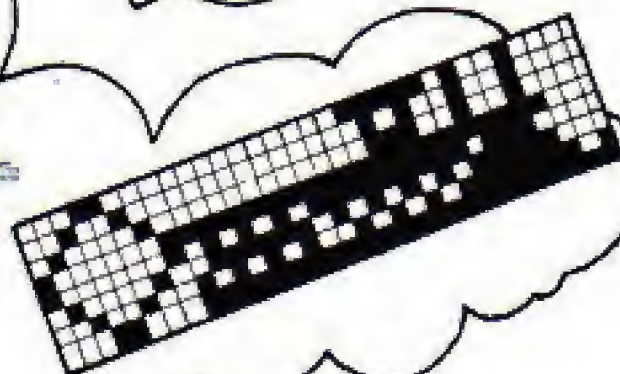
VDU 23, 245, 224, 67, 75,
255, 255, 255, 113, 32
VDU 23, 246, 0, 192, 0, 95,
95, 255, 206, 132



PADDLESTEAMER

From Toby Corbin,
Southampton

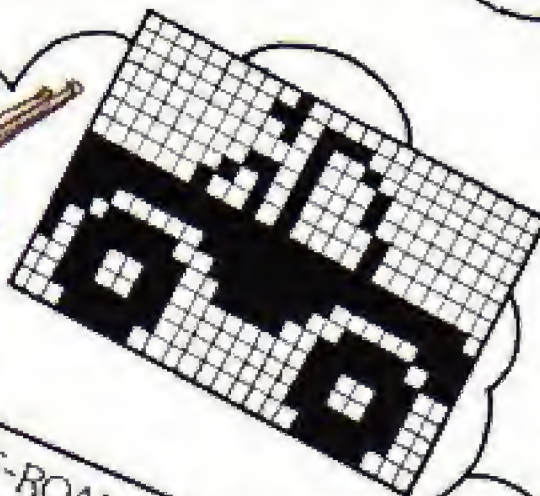
VDU 23, 228, 24, 36, 66,
129, 129, 66, 36, 24
VDU 23, 229, 0, 0, 0, 255,
85, 126, 170, 255
VDU 23, 230, 31, 10, 14,
255, 255, 170, 85, 255
VDU 23, 231, 80, 80, 80,
248, 112, 248, 253, 255



OFF-ROAD PICK-UP TRUCK

From K. Cawsey,
Merseyside

VDU 23, 232, 0, 0, 0,
0, 0, 1, 2, 255
VDU 23, 233, 64, 220, 82,
17, 209, 80, 80, 255
VDU 23, 234, 0, 0, 0, 0,
0, 128, 128, 254
VDU 23, 235, 255, 224, 222,
191, 179, 51, 63, 30
VDU 23, 236, 255, 255, 126,
60, 0, 0, 0, 0
VDU 23, 237, 255, 7, 123, 252,
204, 204, 252, 120



U-BOAT

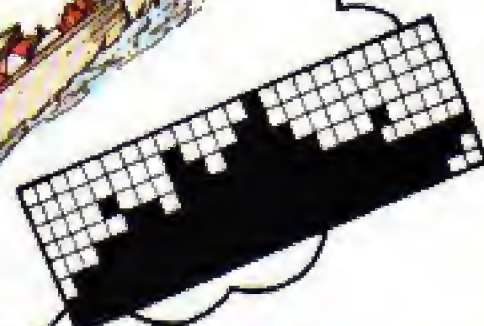
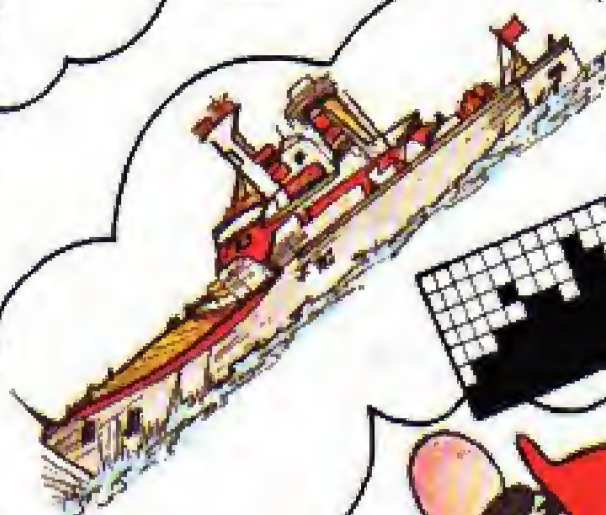
From L. and B. Holgate,
Deeping St. James

VDU 23, 241, 0, 0, 1,
95, 61, 95, 0, 0
VDU 23, 242, 192, 128,
192, 252, 182, 252, 0, 0

BATTLESHIP

From Stephen Ashworth,
Dukinfield, Cheshire

VDU 23, 238, 0, 0, 8, 6, 31,
127, 255, 255
VDU 23, 239, 4, 140, 222,
255, 255, 255, 255, 255
VDU 23, 240, 0, 0, 0, 16,
224, 255, 254, 252



HAVE you a favourite character you would like to see in this monthly feature in Electron User?

Send your drawing of the character, together with the VDU23 statement, to: Shape Dictionary, Electron User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

GAMEMAKER 2

Make your games come alive with multi-coloured shapes and characters. Arcade quality high-speed games are yours if you have an Electron, the ability to write BASIC programs and GAMEMAKER 2.

Design your own:
Flying Ships
Walking Men
Chasing Monsters
Flashing Eyes
Beating Wings



Control them
with simple
commands, e.g.

- *GM left 1
- *GM up 1



- *Easy to use menu style
- *32 shapes each with 2 images
- *48 possible images
- *Different sizes — max. 16 x 24 pixels
- *Naming facility for library usage
- *Tape save and re-load

- *Simple commands from BASIC
- *Variable movement speed
- *Collision detection with other shapes
- *Variable animation speed
- *Name prompter via f1 key
- *Low memory usage



Become an ELECTRON GAMEMAKER 2
Send the coupon below for your copy
Price includes postage, VAT and our guarantee.

£12.99

To: **HOLLY** Computers Ltd
PO Box 17
Bingley
West Yorkshire
BD16 3JJ

Please send me _____ copies of GAMEMAKER 2.
I enclose £_____ in payment.
Name _____

Address _____

Date _____

A010

Sponsored by
The Micro User
and Electron User

Come and Buy!

Everything on display at the show will be for sale – often at special low show prices.

So you'll easily be able to save much more than your admission ticket in your first five minutes at the show!

On sale at the show . . .

BBC Micros
Electrons
Teletext adapters
Torch disc packs
BBC Buggies
Second Processors
ROM Expansion Boards
Grafpads
Books
Joysticks
Interfaces
Disc drives
Data recorders
Lightpens
Modems
Speech Synthesisers
Carrying Cases
Cables
Digitizers
VDU stands
Graphics tablets
ROM chips
Monitors
Printers

PLUS many thousands of software programs – games, educational and business packages.

There's much more to summer we go to a new us much more room to

Alexandra Palace, London N22. Thursday

- ★ **SEE the latest software – hundreds of new games, educational and business programs.**
- ★ **SEE all the latest add-ons – never before have so many exciting new peripherals been launched.**
- ★ **SEE all the latest techniques – and get free advice from our team of experts, writers and programmers.**
- ★ **Make a note in your diary – NOW!**



You must see for yourself all the rapid developments in the ever-expanding world of the Electron and BBC Micro!

show. So this
home – to give
show it all.

to Sunday, July 19 to 22



Reduced prices for School/College Groups

Entry only £1 per student if bookings are made in advance. Send your cheque (made payable to Database Publications) and SAE to:

Electron & BBC Micro User Show
68 Chester Road, Hazel Grove
Stockport SK7 5NY Tel: 061-456 8383

Valid for a minimum of 10 people

SAVE MONEY with our Special Travel and Hotel Offer

Visitors to the Show can obtain cut-price rail tickets from ANY station in the United Kingdom – plus special reduced prices at London hotels.

For full details write to:

Travel Offer, P.O. Box 1, St. Albans AL1 4ED with SAE
or Telephone: St. Albans 34475 quoting: The Electron
& BBC Micro User Show.

**This voucher is worth
£1 per head**



*By handing in this voucher
at the door you save £1 off
the normal admission
price of £3 (adults) and
£2 (children).*

(Valid for a maximum of 4 people)

10am - 6pm, Thursday, 19 July
10am - 6pm, Friday, 20 July
10am - 6pm, Saturday, 21 July
10am - 4pm, Sunday, 22 July

**Alexandra Palace
Wood Green, London N22.**

Number attending: ☐ 1 ☐ 2 ☐ 3 ☐ 4

Chart your progress - in 3D

CHARTIST is a short but very effective program from JON WILLINGTON of Hereford.

It processes information supplied by the user and displays a colourful three-dimensional bar chart.

When you run the program it asks you for the title of the graph and a label for the y axis.

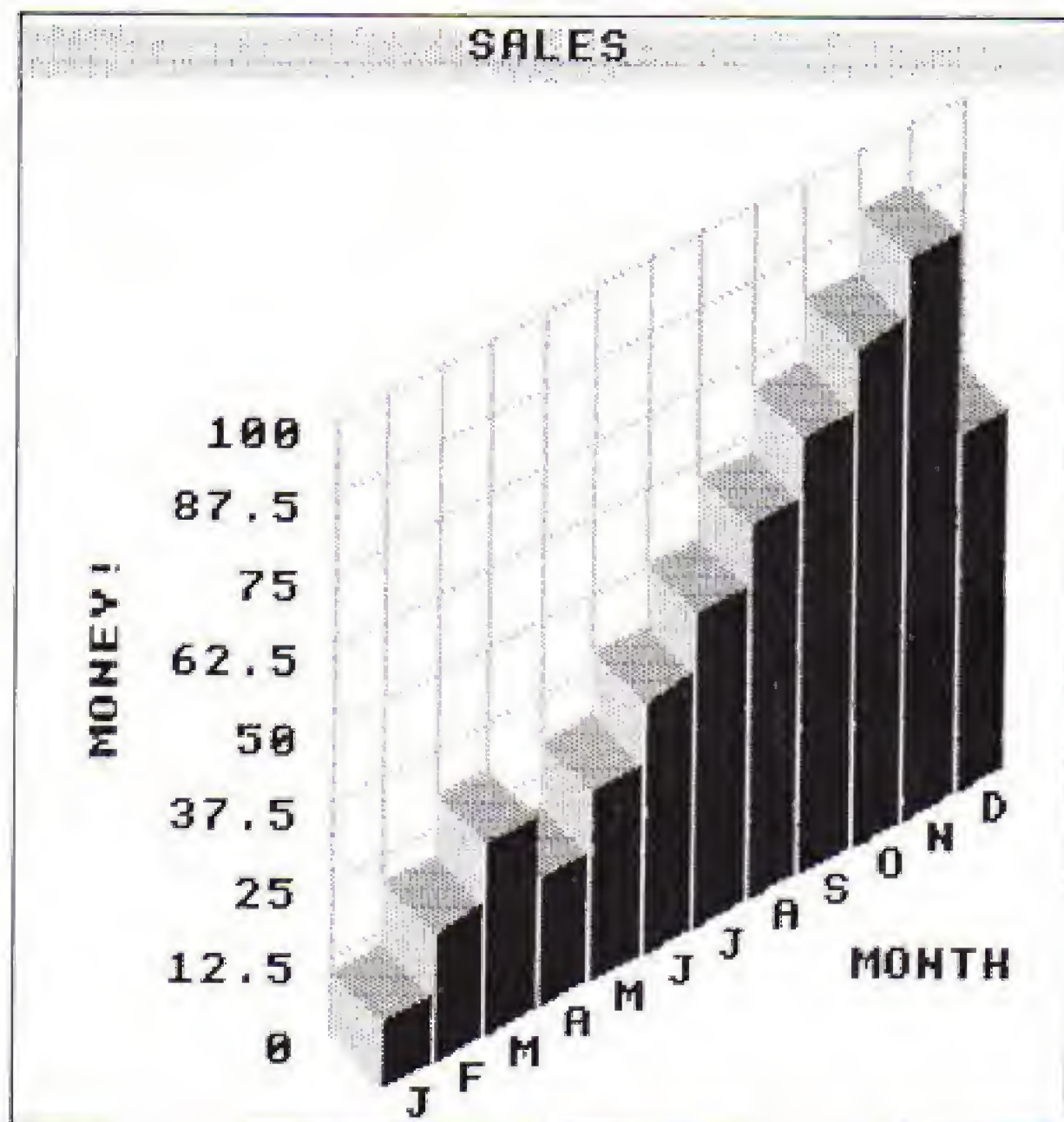
Then you put in your figures for each of the 12 months of the year.

The Electron next prints out a 3D coloured bar chart, showing graphically what has happened over the year.

The program is constructed as shown on the right.

CHARTIST	
TITLE OF GRAPH SALES	
Y-AXIS LABEL MONEY!	
RANGE OF GRAPH: 0 TO 100	
MONTH	VALUE
JANUARY	10
FEBRUARY	20
MARCH	30
APRIL	40
MAY	50
JUNE	60
JULY	70
AUGUST	80
SEPTEMBER	90
OCTOBER	95
NOVEMBER	98
DECEMBER	100

40	Sets mode to Mode 1
50	Calls input routines
60	Sets variables and colours
70-260	Draws and labels axes
270-290	Takes next piece of data to be drawn
300-330	Draws top of block
340-360	Draws front of block
370-400	Draws side of block
410-420	Tidies up graph and end program
430-490	Procedure to print a string sideways
500-740	Input procedure



```

10 REM CHARTIST
20 REM J.WILLINGTON
30 REM (C) ELECTRON USER
40 MODE 1
50 PROCinputs
60 MODE 1
   :VDU 20
70 K=70
   :F1=300
   :VDU 19,3,4;0;
80 X$="MONTH"
90 PROCside(2,10,Y$)
100 COLOUR 2
   :PRINT TAB(25,27)X$
110 COLOUR 131
   :PRINT TAB(0,0)STRING$(80
     ,CHR$ 32)
120 VDU 5
   :V=640-(LEN A$*16)
130 GCOL 0,0
   :MOVE V,1015
   :PRINT A$
   :MOVE V+4,1011
   :PRINT A$
   :GCOL 0,2
   :MOVE V+8,1007
   :PRINT A$
140 SCALE=MAX/8
   :VDU 29,0;-25;
150 FOR R1=0 TO 8
   :GCOL 0,1
160 MOVE F1,R1*K+100
   :PLOT 17,600,300
170 GCOL 0,2
180 MOVE -50,R1*K+100
   :PRINT R1*SCALE
190 NEXT
200 RESTORE 260
210 FOR R1=0 TO 12
   :GCOL 0,1
220 MOVE F1+R1*50,R1*25+100
230 PLOT 1,0,560
240 MOVE F1+R1*50+75,R1*25+50
250 GCOL 0,2
   :READ A$
   :PRINT A$
   :NEXT
260 DATA J,F,M,A,M,J,J,A
     ,S,O,N,D," "
270 FOR B1=12 TO 1 STEP -1
280 GCOL 0,1
   :P=B(B1)
   :P=P/SCALE
290 IF P=0
   THEN NEXT
   :GOTO 270
300 MOVE F1+B1*50,P*K+B1*25+1
     00

```



```

310 MOVE FX+(BX-1)*50,P*K+(BX
-1)*25+100
320 PLOT B5,FX+(BX+1)*50-4
,(P-1)*K+(BX+1)*25+100
330 PLOT B5,FX+BX*50,(P-1)*K+
BX*25+100
340 GCOL 0,2
350 PLOT B5,FX+(BX+1)*50-4
,(BX+1)*25+25
360 PLOT B5,FX+BX*50,BX*25+25
370 GCOL 0,3
:MOVE FX+BX*50,(P-1)*K+BX
*25+100
380 PLOT B5,FX+(BX-1)*50
,P*K+(BX-1)*25+100
390 MOVE FX+BX*50,BX*25+25
:PLOT B1,-50,50
400 NEXT
410 GCOL 0,1
:MOVE FX,100
:DRAW FX,600
420 VDU 4
:VDU 23,1,0;0;0;0;
:REPEAT
: UNTIL FALSE
:END
430 DEF PROCside(JX,KX,A$)
440 GCOL 0,2
:PRINT TAB(0,0)A$
450 FOR AX=40 TO LEN A$*32
STEP 4
460 FOR BX=1023TO 995
STEP -4
470 IF POINT(AX,BX)=3
PLOT 69,JX*32+1023-BX
,KX*32+AX
480 NEXT
:NEXT
490 ENDPROC
500 DEF PROCinputs
510 RESTORE 670
:DIM Q(12)
520 VDU 19,0,4;0;
530 VDU 19,1,6;0;
540 COLOUR 129
:VDU 19,2,15;0;
550 *FX10,50
560 FOR A=0 TO 2
570 PRINT TAB(1,A)STRING$(38
,CHR$ 32)
580 NEXT
590 COLOUR 0
:PRINT TAB(16,1)"CHARTIST
"
600 COLOUR 128
:COLOUR 3
610 INPUT TAB(4,4)"TITLE
OF GRAPH "A$
620 INPUT TAB(4,6)"Y-AXIS
LABEL "Y$
630 INPUT TAB(4,8)"RANGE
OF GRAPH: 0 TO "MAX
640 PRINT TAB(8,11)"MONTH"
SPC 10"VALUE"
650 MOVE 150,175
:DRAW 150,700
:DRAW 1100,700
:DRAW 1100,175
:DRAW 150,175
660 MOVE 150,625
:DRAW 1100,625
:MOVE 600,700
:DRAW 600,175
670 DATA JANUARY,FEBRUARY
,MARCH,APRIL,MAY,JUNE
,JULY,AUGUST,SEPTEMBER
,OCTOBER,NOVEMBER,DECEMBER
680 PRINT
:COLOUR 3
690 FOR A=1 TO 12
:READ T$
700 PRINT TAB(6,A+12)T$
:[INPUT TAB(25,A+12)0
710 Q(A)=0
:NEXT
:COLOUR 2
:COLOUR 129
720 PRINT TAB(8,29)"PRESS
ANY KEY TO CHART"
730 G$=GET$
740 ENDPROC

```

This listing is included in this month's cassette tape offer. See order form on Page 34.

KAY-ESS

COMPUTER PRODUCTS

PROFESSIONAL PROGRAMS FOR THE MODEL B AND ELECTRON

NEW LOW SUMMER PRICES EACH TAPE ONLY £5.95

DESIGN (B/E) NEW VERSION

If you enjoy the idea of creating your own user defined characters but are put off by the time consuming mathematics then DESIGN is for you! DESIGN lets your imagination loose by letting you draw your characters in all 16 colours on an 8 x 8 grid leaving all the hard work to the machine. DESIGN's features include being able to recall multiple characters for re-editing and displaying VDU 23 commands. All characters used in KAY-ESS programs are created using DESIGN.

SPACE TRAFFIC CONTROLLER - NEW (B/E)

As a space traffic controller you have been stationed at the main robot cargo port of the planet Orion. It is your job to get the robot spacecrafts down in one piece. As your confidence increases you can increase the number of crafts allowed within your control area. Warning! Not to be played after a hard or hectic day!

SPACE TANK (B)

After your SPACE TANK has landed on the planet Orion, a series of alien tanks surface hoppers, and spacecrafts will attack. How long can you hold out commander? This game makes use of the Beebe's fast scrolling ability. Can be used with either keyboard or joystick. Top ten table. Pause option.

HORSES (B/E)

Come on now, don't be shy, choose one of the six horses and let's see what you can do. How many of the fences can you complete at the Orion arena, especially with the clock ticking away? New riders can try one of the more docile horses while others may like to risk one of the more lively beasts! Can be used with either keyboard or joystick. Top ten table. Pause option.

STAR HAWKS (B/E)

Can you stop the STAR HAWKS before they stop you? Slow work means the generation of more laser firing mutant hawks. Based on the games of Galaxian and Gorf. Can be used with either keyboard or joystick. Top ten table. Pause option.

ELECTRON PROGRAM CAN BE USED WITH FIRST BYTE JOYSTICK INTERFACES

Watch out for special KAY-ESS double sided tapes at local dealers.

Dealer enquiries welcome!

KAY-ESS computer products previously traded under the name of ORION SOFTWARE.

HANGMAN (B/E)

Let words become fun again with our three language (ENGLISH, FRENCH, ITALIAN) version of the popular game of HANGMAN. There are 3 levels of play for each language. All words can be replaced or removed, and new ones can be added. HANGMAN comes with an instruction program giving full details for parents and teachers. Once winning prying eyes cannot access the word lists!

EARLY YEARS (B/E) For children between 3-6 years of age

These two packages give an adult or older child a means to take a younger child through a series of simple game type tasks to enforce ideas. The emphasis is on learning through fun. Topics covered include subtraction, addition, recognition, colour, shapes, sizes, sounds, notes, co-ordination, distances, estimates, directions.

EARLY YEARS 1

- A) MICKEY THE MONKEY and his apple tree make subtraction fun.
- B) COLOUR BLOCKS bring sizes and colour into perspective.
- C) MERRY MUSIC turns the keyboard into a musical keyboard.
- D) FUNNY FACES presents a line up, which one is the suspect?
- E) FRED THE FROG needs co-ordinated help to get across the pond.

EARLY YEARS 2

- A) THE POND seems very active today.
- B) SPEED is required to keep the cake on the conveyor belt.
- C) DIRECTIONS seem to be needed by everyone in Orion village.
- D) ORDER the blocks.
- E) SID THE SPIDER needs some help to get out of the maze.

All prices are FULLY inclusive for UK orders. Please add £1 per tape for non-UK addresses. Cheques P.O.s should be made payable to KAY-ESS Computer Products.

Available for:
(E) Electron (B) BBC Model B
FREE with all orders is
our 3 level version of
NOUGHTS AND CROSSES!!!

**KAY-ESS Computer Products,
11 Buttercup Close,
Romleighs Park,
Harold Wood,
Essex RM3 0XF.**

NOW AVAILABLE ON THE ELECTRON D.A.C.C.'s SPRITE - GEN

Runs in 4 colours Mode 5

PRICE £9.95

The BBC version of this highly successful package has won a nomination in the 1984 British Micro Computer Awards.

Write your own 'Arcade Action' games with D.A.C.C.

Sprite-Gen

This amazing and revolutionary new piece of software, written for the BBC Model B by Dennis Ibbotson, represents the biggest step forward for BASIC programmers since the release of the BBC Micro itself. It allows you to create multi-coloured, fast moving SPRITES, controlled simply from your own BASIC program. Now you can write the kind of "Arcade Action" games you always dreamed of writing before you discovered that BASIC can't achieve the speeds necessary. Until now, only experienced machine-code programmers could produce "Ghost Gobbling Monsters" and "Light Speed" spacecraft. With SPRITE GRAPHICS all the creatures and objects you can imagine are at your command, moving smoothly at any speed and in any direction you choose. Incredibly, SPRITES can be created using ALL SIXTEEN logical colours - eight steady and eight flashing. And as if that were not enough you animate your SPRITES with individual movements such as "a man who walks", "a bird that flaps its wings", "invaders that pulse menacingly", the possibilities are endless! When you own the SPRITE GENERATOR package you have access to every sort of high-speed animation technique you need. Buying expensive machine-code games may become a thing of the past. Look at the following impressive list of features you can access from your own BASIC programs ...

- Up to 32 SPRITES on screen at any time.
- Limitless SPRITE design using the SPRITE Generator program included in the package, allows ALL SIXTEEN logical colours "in each SPRITE" if desired. Full operating system capability of logical/actual colour assignment.
- There can be up to EIGHT different SPRITE DESIGNS active at one time, each of which can have up to THREE "CLONES", (copies of the primary SPRITE but each with individual movement control).
- Each SPRITE actually has TWO images which given slight differences will achieve the animation effects when the two are alternated. Or, if you choose, give the two images totally different designs and you have created two SPRITES out of one, usable alternately. This technique can also be applied to the CLONES which means that all 32 SPRITES can be animated, multi-coloured, moving objects!!!
- Once you have completed the design of your SPRITES using the simple grid-based generator utility, they and the high speed machine-code routines that control their movement are secreted into RAM and the BASIC system is ready to accept your own program lines through which you can direct the SPRITES to appear, move, disappear or just remain stationary, with the simplest commands you could imagine.
- SPRITES can be linked together in pairs or groups to produce large scale animation. Of course, if you wish they can be as small as a single pixel.
- Your own creations can move in front of each other with no loss of detail.

SPRITE-GEN is supplied as a package containing:

- *** Sprite-Generator program
 - *** Two 'fast-action' demonstration programs
 - *** Sprite-Gen control routines
 - *** Illustrated user manual with examples and listings
- All for only £17.95 (pp and VAT included).
In U.S. \$49.95

BEWARE
OF
IMITATIONS

DRAGON, ATARI 400/800, BBC MODEL/B TRS 80 C/C 32K 747 FLIGHT SIMULATOR

Superbly realistic instrumentation and pilot's view in lifelike simulation which includes emergencies such as engine fires and systems failures. This program uses high resolution graphics to the full to produce the most realistic flight-deck display yet seen on a home computer. There are 21 real dials and 25 other indicators (see diagram). Your controls operate throttle, ailerons, elevators, flaps, slats, spoilers, landing gear, reverse thrust, brakes, etc. You see the runway in true perspective. Uses joysticks and includes options to start with take-off or random landing approach. "A real simulation, not just another game." (Your Comp. Apr. 83)



ACTUAL SCREEN PHOTOGRAPH

CASSETTE £9.95 (pp and VAT included). Joysticks optional (except Dragon).
In U.S. \$27.95 (pp included)

(U.K. orders despatched within 48 hours)

Dealer and foreign distributor enquiries now being taken.
Software writers - sell your programs in the U.S. through DACC.

To DACC Ltd., Dept. EU, 23 Waverley Road, Hindley, Wigan, Lancs. WN2 3BN.

Please rush me:

- ___ qty. SPRITE-GEN at £17.95 each (BBC Model/B only)
- ___ qty. SPRITE-GEN at £9.95 each (Electron only)
- ___ qty. 747 FLIGHT SIMULATOR at £9.95 each (state machine)

I enclose a cheque/P.O. to the value of _____

NAME _____

ADDRESS _____

POST CODE _____

electron

THE BEST ADD-ON FOR
YOUR ELECTRON

ELECTRON PRINTER INTERFACE

Frustrated by the Electron's inability to connect to a printer?

Hold copy is of great assistance when debugging the longer program, and is of enormous value in any educational situation.

As fast a straightforward, economical and easy to use interface to drive most parallel (Centronics) printers is available now ... Epson, Seikosa, ... etc.

Unlike some other interfaces appearing on the market, this module is completely self contained and does not require cassette based software to be loaded each time the printer is to be used.

Just plug in and use. Obeys all BBC commands ... (FXG, VDU1, VDU2, VDU3, etc).

This modular interface measures only 3" x 2" x 4", is entirely self contained and attaches simply and safely to the rear of the Electron. Absolutely no soldering or technical ability required to fit.

Provided with or without integral printer lead from £24.95

BBC leads available from £7.95

(Score Printer, Make, Model etc.)

SOFTWARE AVAILABLE ON REQUEST

Supplied complete with comprehensive instructions

MAIL ORDER ONLY

SAE FOR DETAILS

P&P £1.00

01-771 0695

01-771 0695

PETER JAMES MOORE & ASSOCIATES (MARKETING), 63 HIGH ST, LONDON S.E.25 6EF

'KILLA' THE UPGRADE

by S.D. Ellington From: BIT TWIDDLERS

If you already own the popular game of Killer Gorilla, then 'Killa' will provide:

15 levels of play (BBC) 7 levels of play (Electron), variable extended jump, climb and jump with hammer, extra lives after 25, 50 & 75 metres, practice mode, pause facility.

'MONSTAS' THE UPGRADE

If you already own the popular game 'Monsters' then 'Monstas' will provide:

4 skill levels, variable extended jump, conveyor belt effects, user defined keys, configurable monsters, extra lives after each frame and pause.

Both programs available for Electron or BBC

State which machine.

£2.75 each + 50p p&p or £4.50 for both + 50p p&p

BIT TWIDDLERS,

Dept. EU/6, 158 Church End, Harlow, Essex CM19 5PF

*Monsters is a trademark of Acornsoft.



C15 COMPUTER CASSETTES

35p

- ★ Quality computer cassettes
- ★ Leaderless tape
- ★ Screw construction
- ★ Plastic library case
- ★ Approved by leading software house

Box of 10 ... £3.50 + £1 p&p

Cheques, P.O.'s to:



HAYSTACK PERIPHERALS

5 Church Road,
Greenfield,
Oldham OL3 7LQ.

Educational and Dealer Enquiries Welcome

From Page 33

```

400 NEXT i
410 ENDPROC
420
430 DEF PROCfairway
440 GCOL 0,3
450 j=832
460 MOVE 0,832
    : MOVE 0,650
470 FOR i=64 TO 1216
    STEP 64
480 j=j+RND(32)+(j>500)-
    RND(32)*(j<960)
490 PLOT 85,i,j
500 PLOT 85,i+32,j-160
510 NEXT i
520 ENDPROC
530
540 DEF PROCbunkers
550 VDU 5
560 GCOL 0,7
570 FOR i=1 TO 5
580 MOVE 200+RND(800)
    ,650+RND(200)
590 PRINT CHR$ 225
600 NEXT i
610 VDU 4
620 ENDPROC
630
640 DEF PROClake
650 VDU 5
660 GCOL 0,4
670 MOVE 200+RND(800)
    ,700+RND(200)
680 VDU 227,228,8,8,10
    ,229,230
690 VDU 4
700 ENDPROC
710
720 DEF PROCplay_hole
730 GCOL 3,8
740 xX=32
    : yX=800
750 FOR i=1 TO players
760 position(i,1)=xX
770 position(i,2)=yX
780 PLOT 69,xX,yX
790 holed(i)=FALSE
800 in_hazard(i)=FALSE
810 yX=yX-32
820 NEXT i
830 REPEAT

```

This listing was produced using a special formatter which breaks one program line over several lines of listing. When entering a line don't press Return until you come to the next line number. Full details of the formatter are given on Page 4 of the February issue.

```

840 FOR n=1 TO players
850 IF NOT holed(n)
    THEN PROCshot
    : shots(n)=shots(n)+1
860 NEXT n
870 UNTIL FNall_holed
880 ENDPROC
890
900 DEF PROCshot
910 xX=position(n,1)
920 yX=position(n,2)
930 PRINT TAB(0,20);"Player
    "n;" Shots:"shots(n)
    ;SPC (180);
940 PROCinput_direction
950 PROCinput_distance
960 PROCcalculate_point
970 PROCit_ball
980 position(n,1)=xX
990 position(n,2)=yX
1000 ENDPROC
1010
1020 DEF PROCinput_direction
1030 REPEAT
1040 *FX21,0
1050 PRINT TAB(0,22);"Direct
    ion
1060 PRINT " 1 2 3"
    " 4 ";CHR$ 231;" 5"
    " 6 7 8"
1070 INPUT TAB(10,22);direct
    ionX
1080 UNTIL directionX>0
    AND directionX<9
1090 PRINT TAB(11,22);direct
    ionX
1100 PRINT "SPC (100)
1110 ENDPROC
1120
1130 DEF PROCinput_distance
1140 REPEAT
1150 *FX21,0

```

```

1160 PRINT TAB(0,24);"Distan
    ce
1170 PRINT "(1 - 200)"
1180 INPUT ,TAB(10,24);dista
    nceX
1190 UNTIL distanceX>0
    AND distanceX<201
1200 PRINT "SPC (9)
1210 distanceX=2*distanceX
1220 IF in_hazard(n)
    THEN distanceX=
    RND(distanceX)
    : in_hazard(n)=FALSE
1230 ENDPROC
1240
1250 DEF PROCcalculate_point
1260 ON directionX GOTO
    1270 ,1280 ,1290
    ,1300 ,1310 ,1320
    ,1330 ,1340
1270 nxX=xX-(2*distanceX)
    DIV 3
    : nyX=yX+(2*distanceX)
    DIV 3
    : ENDPROC
1280 nyX=yX+distanceX
    : nxX=xX
    : ENDPROC
1290 nxX=xX+(2*distanceX)
    DIV 3
    : nyX=yX-(2*distanceX)
    DIV 3
    : ENDPROC
1300 nxX=xX-distanceX
    : nyX=yX
    : ENDPROC
1310 nxX=xX+distanceX
    : nyX=yX
    : ENDPROC
1320 nxX=xX-(2*distanceX)
    DIV 3
    : nyX=yX-(2*distanceX)

```



```

    DIV 3
    : ENDPROC
1330 nyX=yX-distanceX
    : nxX=xX
    : ENDPROC
1340 nxX=xX+(2*distanceX)
    DIV 3
    : nyX=yX-(2*distanceX)
    DIV 3
    : ENDPROC
1350
1360 DEF PROCit_ball
1370 SOUND 0,-15,4,1
1380 PLOT 69,xX,yX
1390 GCOL 3,7
1400 DRAW nxX,nyX
1410 PROCpause(100)
1420 MOVE xX,yX
1430 DRAW nxX,nyX
1440 PROCcheck_position
1450 IF NOT lost_ball
    THEN xX=nxX
    : yX=nyX
1460 GCOL 3,8
1470 IF NOT holed(n)
    THEN PLOT 69,xX,yX
1480 ENDPROC
1490
1500 DEF PROCcheck_position
1510 COLOUR 6
1520 lost_ball=FALSE
1530 point=POINT(nxX,nyX)
1540 IF point=4

```


Golf listing

From Page 55

```

      THEN PRINT "Lost ball
      in lake !";
1550 IF point=2
      THEN PRINT "Ball in
      rough";
1560 IF point=7
      THEN PRINT "Ball in
      bunker";
1570 IF point=5
      THEN PRINT "Lost ball
      in tree !";
1580 IF point=0
      THEN holed(n)=TRUE
      : SOUND 1,1,100,20

      : PRINT "** Well Done
      **";
      : PROCpause(500)
1590 IF point=-1 PRINT
      "Out of bounds !";
1600 IF point=4 OR point=5
      OR point=-1
      THEN SOUND 1,-15,0
      ,20
      : PROCpause(500)
      : lost_ball=TRUE
1610 IF point=2 OR point=7

      THEN SOUND 1,-15,20
      ,20
      : PROCpause(500)
      : in_hazard(n)=TRUE
1620 COLOUR 7
1630 ENDPROC
1640
1650 DEF Fball_holed
1660 number=0
1670 FOR i=1 TO players
1680 IF holed(i)
      THEN number=number+1
1690 NEXT i
1700 IF number=players

      THEN =TRUE
1710 IF number<players

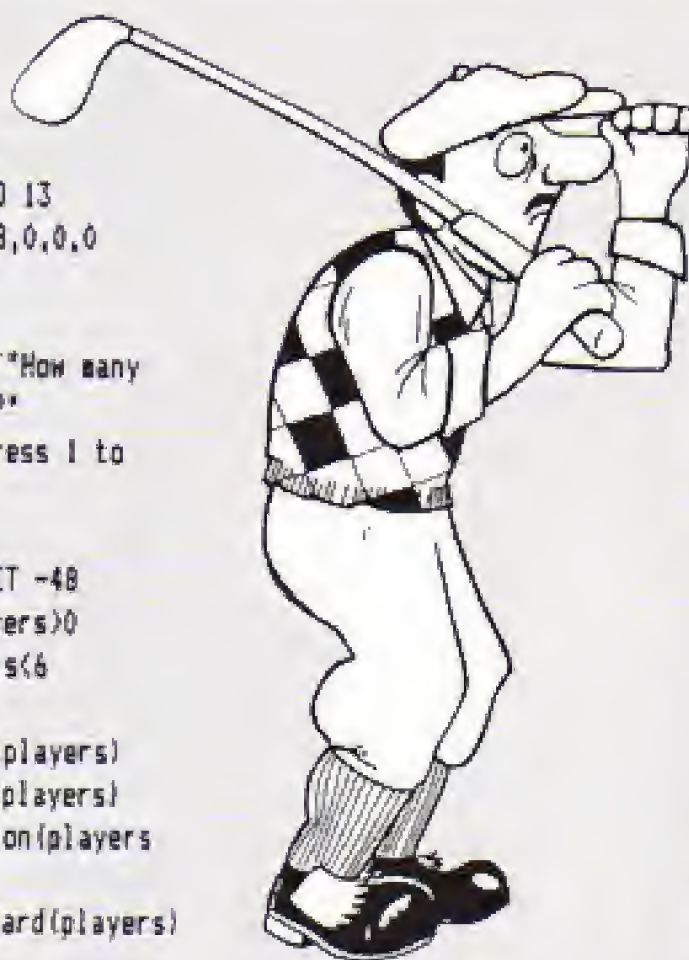
      THEN =FALSE
1720
1730 DEF PROCset_variables
1740 VDU 19,6,9,0,0,0
1750 VDU 23,1,0;0;0;0;0;
1760 VDU 24,0;448;1279;992;

```

```

1770 FOR i=9 TO 13
1780 VDU 19,i,8,0,0,0
1790 NEXT i
1800 COLOUR 7
1810 PRINT "How many
      players ?"
1820 PRINT "Press 1 to
      5"
1830 REPEAT
1840 players=GET -48
1850 UNTIL players>0
      AND players<6
1860 CLS
1870 DIM holed(players)
1880 DIM shots(players)
1890 DIM position(players
      ,2)
1900 DIM in_hazard(players)
1910 ENDPROC
1920
1930 DEF PROCpause(delay)
1940 TIME =0
1950 REPEAT
1960 UNTIL TIME >delay
1970 ENDPROC
1980
1990 DEF PROCinitialise
2000 VDU 23,224,32,96,224
      ,32,32,32,32,0
2010 VDU 23,225,24,62,127
      ,63,126,248,224,192
2020 VDU 23,226,0,0,0,0
      ,7,7,7,7
2030 VDU 23,227,24,62,127
      ,255,255,127,63,127
2040 VDU 23,228,12,30,191
      ,255,254,252,248,248
2050 VDU 23,229,255,255
      ,127,63,63,127,63
      ,31
2060 VDU 23,230,252,252
      ,254,254,252,240,192
      ,0
2070 VDU 23,231,146,84
      ,56,254,56,84,146
      ,0
2080 ENVELOPE 1,1,-1,0
      ,0,100,0,0,126,0,0
      ,-126,126,126
2090 *KEY10 "OLD IM RUN
      IM"
2100 *FX4,1
2110 *FX11,0
2120 *FX229,1

```



```

2130 ENDPROC
2140
2150 DEF PROCscores
2160 VDU 26
      : CLS
2170 COLOUR 6
2180 PRINT "SCORES"
2190 COLOUR 5
2200 PRINT "-----"
2210 PRINT "After 9 holes..
      ."
2220 COLOUR 3
2230 FOR n=1 TO players
2240 PRINT "Player ";n;
      ": ";shots(n);" shots"
2250 NEXT n
2260 PRINT "
2270 ENDPROC
2280
2290 DEF PROCgame_over
2300 *FX4,0
2310 *FX12,0
2320 *FX229,0
2330 VDU 23,1,1;0;0;0;0;
2340 ENDPROC
2350
2360 DEF PROCinstructions
2370 PRINT "TAB(7);\"GOLF\"
2380 PRINT "TAB(6);\"-----\"
2390 COLOUR 3
2400 PRINT "Golf can be
      played"
2410 PRINT "by up to 5
      players.""
2420 COLOUR 6

```

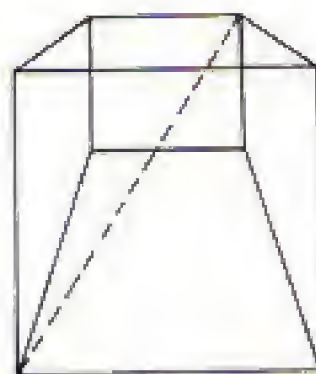
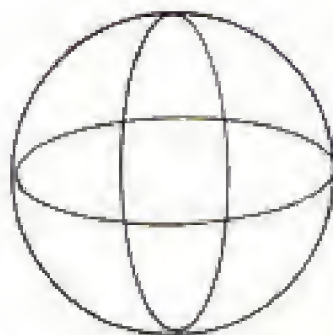
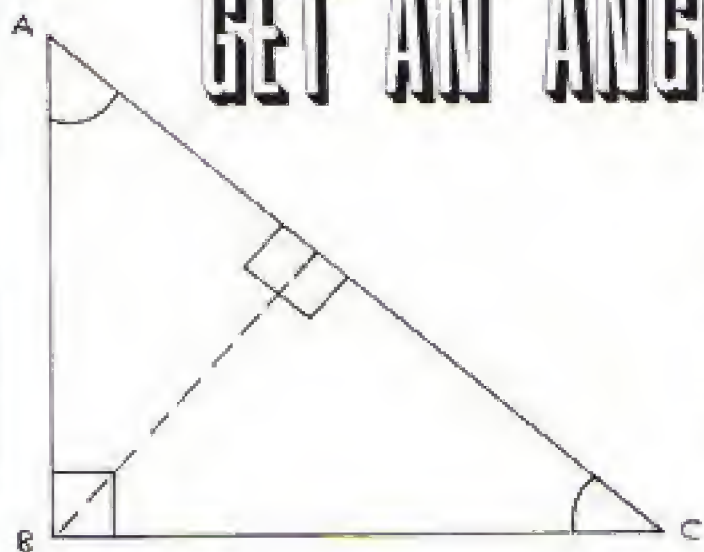
```

2430 PRINT "Go round the
      9 hole"
2440 PRINT "course using
      as few"
2450 PRINT "strokes as
      possible."
2460 COLOUR 5
2470 PRINT "Avoid the bunke
      rs"
2480 PRINT "and the rough,
      they"
2490 PRINT "can be hard
      to get"
2500 PRINT "out of."
2510 COLOUR 2
2520 PRINT "Press space...";
2530 SOUND 1,-15,100,5
2540 REPEAT
2550 UNTIL GET$ =" "
2560 CLS
      : COLOUR 7
2570 COLOUR 130
      : PRINT TAB(0,2);
      SPC (2);
      : COLOUR 126
      : PRINT " = rough"
2580 COLOUR 131
      : PRINT TAB(0,4);
      SPC (2);
      : COLOUR 126
      : PRINT " = fairway"
2590 COLOUR 4
      : PRINT TAB(0,6);
      : VDU 227,228,8,8
      ,10,229,230,11
      : COLOUR 7
      : PRINT " = lake"
2600 VDU 225
      : PRINT " = bunker"
2610 COLOUR 5
      : PRINT "**";
      : COLOUR 7
      : PRINT " = tree"
2620 COLOUR 8
      : PRINT " .";
      : COLOUR 7
      : PRINT " = ball"
2630 SOUND 1,-15,100,5
2640 ENDPROC

```

This listing is included in this month's cassette tape offer. See order form on Page 34.

GET AN ANGLE ON GEOMETRY



FED up with figuring things out the hard way? Don't worry, RICHARD RENNIE's program Formulae will make things easy for you.

Want to know the volume of a sphere or the area of a triangle? Trying to get an angle on a cosine? It couldn't be simpler!

All you do is run Formulae, reply to the questions the Electron will ask and you'll be given the answer you want.

```
10 REM --VOLUME--AREA--TRIGONOMETRY--
20 REM By Richard Rennie
30 REM (C)ELECTRON USER
40 MODE 2
50 COLOUR 6
  :PRINT TAB(1,5)"By Richard Rennie"
60 VDU 23,1;0;0;0;0
70 COLOUR 2
  :PRINT TAB(9,8)"FOR"
80 PRINT TAB(3,10)"ELECTRON USER"
90 COLOUR 10
  :PRINT TAB(7,20)"VOLUME"
100 COLOUR 12
  :PRINT TAB(8,23)"AREA"
110 COLOUR 14
  :PRINT TAB(4,26)"TRIGONOMETRY"
120 FOR T=1 TO 2000
130 NEXT T
140 CLS
150 MODE 6
160 PRINT TAB(0,3)"I'm not just good for games you know." "I am also excellent at maths."
170 PRINT "Don't believe me? Then I'll prove it!" "What would you like me to do?"
180 VDU 23,1;0;0;0;0
190 PRINT TAB(5,20)"--PRESS SPACE TO CONTINUE--"
200 WAIT$=GET$
210 CLS
220 PRINT
230 PRINT "VOLUME.....(press 1)"
240 PRINT "AREA.....(press 2)"
250 PRINT "TRIGONOMETRY....(press 3)"
260 INPUT Z
270 IF Z=1
  THEN PROCVOLUME
280 IF Z=2
```

```
  THEN PROCAREA
290 IF Z=3
  THEN PROCTRIG
300 IF Z<1 OR Z>3
  THEN GOTO 260
310 PRINT
320 PRINT "-----"
330 GOTO 230
340 DEF PROCVOLUME
350 PRINT "Do you want to find the volume of a PRISM, a CONE, a PYRAMID, a CYLINDER or a SPHERE"
360 INPUT V$
365 IF INSTR("PRISM CONE PYRAMID CYLINDER SPHERE",V$)=0
  THEN GOTO 350
370 IF V$="PRISM" OR V$="CYLINDER"
  THEN PROCPRISM
380 IF V$="CONE" OR V$="PYRAMID"
  THEN PROCPRISM
390 IF V$="SPHERE"
  THEN PROCSPHERE
400 PRINT "The volume of the ";V$;" is ";X
410 ENDPROC
420 DEF PROCPRISM
430 PRINT "Please enter area of base"
  :INPUT Q
440 PRINT "Please enter height"
  :INPUT M
450 X=Q*M
460 ENDPROC
470 DEF PROCPRISM
480 PRINT "Please enter area of base"
  :INPUT E
490 PRINT "Please enter height"
  :INPUT R
500 X=(E/0.333)*R
```

```
510 ENDPROC
520 DEF PROCSPHERE
530 PRINT "Please enter radius"
  :INPUT Y
540 X=Y^3*3.14*(4/3)
550 ENDPROC
560 REM
570 DEF PROCAREA
575 REPEAT
580 PRINT "Do you want to find the area of a RECTANGLE (press 1), a SQUARE (press 2), a TRIANGLE (press 3) or a CIRCLE (press 4)"
590 INPUT C
595 UNTIL C<5 AND C>0
600 IF C=1
  THEN PROCRECTANGLE
610 IF C=2
  THEN PROC SQUARE
620 IF C=3
  THEN PROCTRiangle
630 IF C=4
  THEN PROC CIRCLE
640 PRINT "That has an area of ";B
650 ENDPROC
660 DEF PROCRECTANGLE
670 PRINT "What is the length"
  :INPUT L
680 PRINT "What is the breadth"
  :INPUT K
690 B=L*K
700 ENDPROC
710 DEF PROC SQUARE
720 PRINT "What is the length"
  :INPUT J
730 B=J*J
740 ENDPROC
750 DEF PROCTRiangle
760 PRINT "What is the length of the base"
```

```
  :INPUT H
770 PRINT "What is the height"
  :INPUT G
780 B=(H/2)*G
790 ENDPROC
800 DEF PROC CIRCLE
810 PRINT "What is the radius"
  :INPUT F
820 B=F*F*3.14
830 ENDPROC
840 REM
850 DEF PROCTRIG
860 PRINT "Do you want to find the SIN, COS or TAN of the angle"
870 INPUT D$
875 IF INSTR("SIN COS TAN",D$)=0
  THEN GOTO 860
880 PRINT "What is the angle you want to find the ";D$;" of"
890 INPUT P
900 IF D$="SIN"
  THEN PROC SIN
910 IF D$="COS"
  THEN PROC COS
920 IF D$="TAN"
  THEN PROC TAN
930 PRINT "The ";D$;" of ";P;" is ";O
940 ENDPROC
950 DEF PROC SIN
960 O=SIN (P/57.296)
970 ENDPROC
980 DEF PROC COS
990 O=COS (P/57.296)
1000 ENDPROC
1010 DEF PROC TAN
1020 O=TAN (P/57.296)
1030 ENDPROC
```

This listing is included in this month's cassette tape offer. See order form on Page 34.

Solitaire listing

From Page 9

```

10 REM SOLITAIRE
20 REM BY R.CARTWRIGHT
30 REM (C) ELECTRON USER
40 ON ERROR PROCerror
50 MODE 5
  :VDU 23,1,0;0;0;0;
60 COLOUR 129
  :CLS
70 PRINT TAB(1,12);"DO YOU
  WANT TO SEE
      THE INSTRUCTIONS
      (Y/N)?"
80 IF GET$="Y"
  THEN CLS
  :PROCinst
90 PROCinit
  :CLS
100 PROCdisplay
  :TIME =0
110 REPEAT
120 VDU 4
130 PROCmove
140 UNTIL count=31
150 PROCfinish
160 PRINT TAB(3,20);"PRESS
  SPACE BAR"
  :PRINT
  :PRINT " TO PLAY AGAIN "
170 IF GET =32
  THEN RUN
  ELSE END
180 END
190 DEF PROCdisplay
200 VDU 5
  :MOVE 600,970
  :PRINT "X"
  :MOVE 32,540
  :PRINT "Y"
210 GCOL 0,0
  :FOR I=814 TO 150
  STEP -96
220 MOVE 128,I
  :DRAW 1136,I
  :NEXT
230 FOR I=254 TO 1100
  STEP 128
240 MOVE I,150
  :DRAW I,900
  :NEXT
250 GCOL 0,3
  :VDU 5
  :CO=0
260 FOR I=222 TO 1100
  STEP 128
270 MOVE I,150
  :PRINT :CO
280 MOVE I,920
  :PRINT :CO
290 CO=CO+1
  :NEXT
300 CO=0
  :FOR I=830 TO 165
  STEP -96
310 MOVE 115,I
  :PRINT :CO
320 MOVE 1136,I
  :PRINT :CO
330 CO=CO+1
  :NEXT
  :GCOL 0,0
340 FOR I=864 TO 224
  STEP -96
350 FOR J=448 TO 768
  STEP 128
360 MOVE J,I
  :PROCdisc
370 NEXT
  :NEXT
380 FOR I=672 TO 416
  STEP -96
390 FOR J=192 TO 1024
  STEP 128
400 MOVE J,I
  :PROCdisc
410 NEXT
  :NEXT
420 MOVE 576,576
  :GCOL 0,3
  :PROCdisc
430 ENDPROC
440 DEF PROCmove
450 COLOUR 3
  :COLOUR 129
  :GO=1
460 PRINT TAB(1,30);"ENTER
  (X)"
  :X=(GET -48)*8+12
  :SOUND 1,1,90,3
  :PRINT TAB(1,30);"ENTER
  (Y)"
  :Y=(GET -48)*3+5
  :SOUND 1,1,90,3
470 PRINT TAB(1,30);SPE (10)
  :P=1
480 PROCcheck(X,Y)
490 IF GO=-1
  THEN SOUND 1,5,4,10
  :ENDPROC
500 VDU 5
  :GCOL 0,2
510 MOVE X*16,1024-(Y*32)
  :PROCdisc
520 VDU 4
  :GO=2
  :COLOUR 3
  :COLOUR 129
530 PRINT TAB(1,30);"L/R/U/D?
  :DIR=GET
  :SOUND 1,1,90,6
540 PRINT TAB(1,30);SPE (10)
550 IF DIR=76
  THEN PROCcl
560 IF DIR=82
  THEN PROCcr
570 IF DIR=85
  THEN PROCcu
580 IF DIR=68
  THEN PROCcd
590 IF GO=2
  THEN SOUND 1,5,4,10
  :GOTO 530
600 IF GO=-1
  THEN MOVE X*16,1024-(Y*32)
  :GCOL 0,0
  :VDU 5
  :PROCdisc
  :SOUND 1,5,4,10
  :ENDPROC
610 VDU 5
  :MOVE NX*16,1024-(NY*32)
620 GCOL 0,0
  :PROCdisc
630 MOVE NX*16,1024-(NY*32)
640 GCOL 0,3
  :PROCdisc
650 MOVE X*16,1024-(Y*32)
  :PROCdisc
  :count=count+1
660 ENDPROC
670 DEF PROCcheck(x,y)
680 GO=1
  :colour=POINT(x*16+64
  ,1024-(y*32))
690 IF colour<>0 AND P=1
  THEN GO=-1
700 IF colour<>3 AND P=2
  THEN GO=-1
710 ENDPROC
720 DEF PROCinit
730 VDU 23,224,3,15,63,127
  ,127,255,255,255
  :VDU 23,225,192,240
  ,252,254,254,255,255
  ,255
  :VDU 23,226,255,255
  ,255,255,255,255,255
  ,255
  :VDU 23,227,255,255
  ,255,127,127,63,15,3
  :VDU 23,228,255,255
  ,255,254,254,252,240
  ,192
  :VDU 19,2,15;0;
  :count=0
740 ENVELOPE 1,1,20,-20
  ,20,200,200,200,127
  ,127,127,127,127,127
750 SOUND 1,1,200,120
760 ENDPROC
770 DEF PROCdisc
780 VDU 224,225,10,8,8,226
  ,226,10,8,8,227,228
790 ENDPROC
800 DEF PROCcl
810 NX=X-8
  :NY=Y
820 P=1
  :PROCcheck(NX,NY)
830 IF GO=-1
  THEN ENDPROC
840 NX2=NX-8
  :NY2=NY
850 P=2
  :PROCcheck(NX2,NY2)
860 ENDPROC
870 DEF PROCcr
880 NX=X+8
  :NY=Y
890 P=1
  :PROCcheck(NX,NY)
900 IF GO=-1
  THEN ENDPROC
910 NX2=NX+8
  :NY2=NY
920 P=2
  :PROCcheck(NX2,NY2)
930 ENDPROC
940 DEF PROCcu
950 NX=X
  :NY=Y-3
960 P=1
  :PROCcheck(NX,NY)
970 IF GO=-1
  THEN ENDPROC
980 NX2=NX
  :NY2=NY-3
990 P=2
  :PROCcheck(NX2,NY2)
1000 ENDPROC
1010 DEF PROCcd
1020 NX=X
  :NY=Y+3
1030 P=1
  :PROCcheck(NX,NY)
1040 IF GO=-1
  THEN ENDPROC
1050 NX2=NX
  :NY2=NY+3
1060 P=2
  :PROCcheck(NX2,NY2)
1070 ENDPROC
1080 DEF PROCfinish
1090 VDU 4
  :COLOUR 129
  :COLOUR 3
  :CLS

```



```

1100 IF count=31          :PRINT
      THEN PROCsuccess    :PRINT ; " ";TIME
      :ENDPROC            DIV 6000;"mins ";
1110 PRINT TAB(1,10); "YOU :PRINT
      DIDN'T FINISH"      1160 ENDPROC
      :PRINT              1170 DEF PROCinst
      :PRINT " THE GAME BUT 1180 PRINT TAB(5,2); "SOLITAIRE
      YOU"                "
      :PRINT              1190 PRINT SPC (20)
      :PRINT " REMOVED ";count: 1200 PRINT " THE OBJECT OF
      " COUNTERS"         THE"
      :PRINT              :PRINT " GAME IS TO REMOV
      :PRINT " IN ";TIME   E"
      DIV 6000;"mins ";    :PRINT " ALL BUT ONE
      TIME MOD 6000 DIV 100; OF THE"
      "secs"              :PRINT " BLACK COUNTERS."
1120 ENDPROC              :PRINT " THIS IS DONE
1130 DEF PROCsuccess      BY"
1140 PRINT TAB(2,5); "CONGRATUL
      ATIONS!"            :PRINT " HOPPING OVER
1150 PRINT TAB(2,8); "YOU SUCCE
      SSFULLY"            THEN"
      :PRINT              1210 PRINT " INTO A SPACE.THE"
      :PRINT " COMPLETED THE" :PRINT " PIECE JUMPED
      :PRINT              IS"
      :PRINT " SAME IN"    :PRINT " THEN REMOVED."
      1220 PRINT
1230 PRINT " TO MOVE A COUNTER :PRINT " IF AT ANY TIME"
      "                   :PRINT " YOU REACH A
      :PRINT " YOU FIRST ENTER" POINT"
      :PRINT " IT'S COORDINATES :PRINT " WHEN YOU CAN'T"
      "                   :PRINT " MOVE,PRESS (ESCA
      :PRINT " (X) THEN (Y). " PE)"
      :PRINT " YOU ARE THEN 1280 PRINT " YOUR GAME WILL
      GIVEN"              NOW"
1240 PRINT " THE OPTION OF" :PRINT " BE ASSESSED"
      :PRINT " MOVING IT LEFT," :PRINT TAB(3,30); "PRESS
      :PRINT " RIGHT,UP OR    ANY KEY"
      DOWN"              1290 WAIT=GET
      :PRINT " THE COMPUTER 1300 ENDPROC
      DGES"              1310 DEF PROCerror
      :PRINT " THE REST."    1320 IF ERR =17
1250 PRINT TAB(3,30); "PRESS THEN 150
      ANY KEY"            ELSE REPORT
      :WAIT=GET             :PRINT " at line ";
      :CLS                  ERL
1260 PRINT TAB(0,3); " IF YOU :FOR I=1 TO 1000
      ENTER AN "          :NEXT
      :PRINT " INCORRECT MOVE :ENDPROC
      YOU"
      :PRINT " WILL BE MADE TO"
      :PRINT " ENTER IT AGAIN."
1270 PRINT

```

This listing is included in this month's cassette tape offer. See order form on Page 34.

EPIC ADVENTURES

FULL-SCALE MACHINE CODE ADVENTURES FOR THE BBC AND ELECTRON

OUR AMAZING NEW ADVENTURE IS NOW AVAILABLE

THE WHEEL OF FORTUNE

They said it couldn't be done on the Beeb — but we've done it!

The Wheel of Fortune is a classic puzzle adventure, with 250 locations, and brings the following advanced features together for the first time:-

* Sophisticated language and speech interpreters capable of accepting single or multiple commands, up to 254 characters in length. Complex multiple commands are phrased just as you would speak them.

* Moving characters with varying moods. These characters remain active whether you type anything or not. Their reactions to you will depend upon the way in which you have previously treated them. The speech interpreter allows you to talk to them, to either give them commands or information, or to ask them questions.

* Instant half-screen teletext graphics for each location (BBC only). These remain on screen with the text and both may be studied simultaneously. The graphics may be switched on or off, as required.

* You may save your position on tape OR DISC, using a different filename for each position.

* Up to 10 commonly-used command sentences can be stored and called up as required. The stored sentences may be changed during the game.

* No frustrating illogical mazes * Humorous character behaviour * Scoring * Fast response * Fully disc compatible * Etc. Etc.

This masterpiece of programming is available for BBC or Electron (state which) for only £9.95

Also available are our 3 popular text adventures. Each has approx. 230 locations and costs just £7.95

1) Castle Frankenstein 2) The Quest for the Holy Grail 3) The Kingdom of Klein

P&P FREE if ordering 2 or more games, otherwise add 50p

EPIC SOFTWARE

DEPT EB

10 GLADSTONE STREET, KIBWORTH BEAUCHAMP, LEICESTER LE8 0HL

Please make cheques payable to EPIC SOFTWARE

All our programs are available for immediate despatch

Dealer enquiries welcome



Tutorial Software Ltd.

SENIOR SCHOOL EDUCATIONAL PROGRAMS

Developed in schools and now available to interested home micro users. Research has identified the compulsory exam topics, and professional programmers have coded these into exciting educational games which have been proven to effectively teach and entertain.

Now available for BBC B and ELECTRON. Each pack contains main program, extra self test program and Core Facts book for only £11.95 or any two for £19.95.

MATHS 1:
TRY-ANGLES

Draughts style teaches angles ratios, tan, sin, cos. 25 levels

MATHS 2:
COORDINATES

Battleship style teaches x and y in four sectors, directed numbers

PHYSICS 1:
ARCHIMEDES

Submarine style teaches Archimedes Principle, pressure and upthrust

PHYSICS 2:
ISAAC

Gunnery style teaches mass, weight Newtons Laws and projectiles

GEOGRAPHY 1:
MAYDAY

Orienteering style teaches O.S. symbols, grid references, bearings

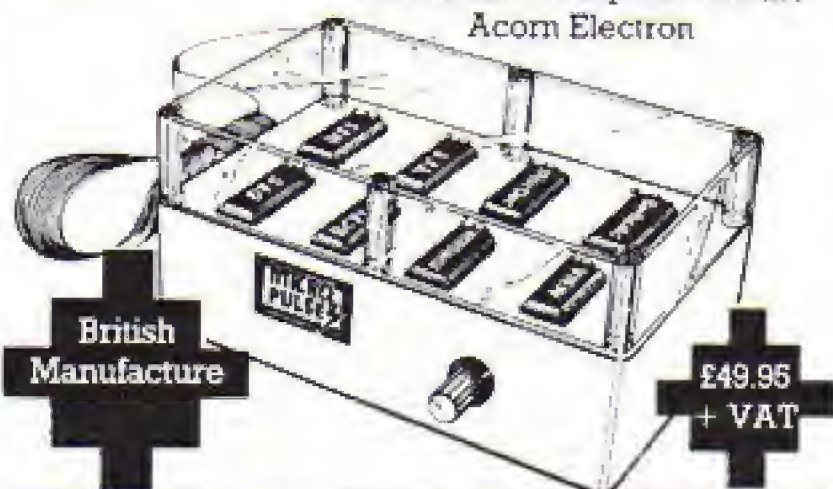
GEOGRAPHY 2:
WEATHER

Forecasting style teaches symbols, pressure systems, synoptic charts

Send your name, address, and cheque/P.O. to DEPT. E.
TUTORIAL SOFTWARE LTD., FREEPOST, WIRRAL, MERSEYSIDE L61 1AB.
Please state BBC B or ELECTRON

THE MICRO PULSE EXTERNAL ROM BOARDS

For the BBC Computer and the
Acom Electron



- ◆ BRITISH MANUFACTURE ◆ ALLOWS 8 ROMS ON LINE
- ◆ HARDWARE-BASED ROM SELECTION AVOIDS SOFTWARE INTERACTION BETWEEN UTILITY ROMS
- ◆ SWITCH TO REQUIRED ROM USING MANUAL SWITCH OUTSIDE THE UNIT
- ◆ RED LIGHTS INDICATE THE SELECTED ROM
- ◆ HIT "BREAK" TO ACCESS ROM, NO NEED TO USE SOFTWARE COMMAND
- ◆ INCLUDES ZIP SOCKET, FOR INSTANT CHANGING OF A SELECTED ROM
- ◆ INCLUDES BBC CABLE AND ROM SOCKET CONNECTOR
- ◆ INCLUDES SIMPLE FITTING INSTRUCTIONS, JUST PLUG IN AND GO!

please contact: Gareth Lattier
Mark Howard or
Judith Allen at
Micro Pulse
Division

**northern
computers**

Churchfield Road,
FRODSHAM
Cheshire WA6 6RD
Tel: 0928 351110

ADVERTISERS INDEX

Alligata Software	40
Ampalsoft	4
Bit Twiddlers	54
DACC	54
Epic Software	59
First Byte Computers	13
Golem	42
H.C.C.S.	60
Haystack Peripherals	54
Holly Software	49
Kay-Ees Computer Products	53
Kosmos Software	18, 26
M.P. Software & Services	60
Micropower	24, 25, 64
Mushroom Computers	2
National Micro Centres	22, 23
Northern Computers	60
Optima Software	41
Opus Supplies	38
Peter James Moore	54
SCI (UK)	6
Signpoint	5
Simonsoft	18
Squirrel Software	42
Sir Computers	42
Superior Software	63
Tutorial Software	59

EVERYTHING TO DO WITH THE electron

Contact
**H.C.C.S.
ASSOCIATES**

533 Durham Road, Low Fell, Gateshead,
Tyne & Wear NE9 5EY.
Tel: (0632) 821924

Retail Sales also at:
H.C.C.S. Microcomputers
122 Darwen Street, Blackburn, Lancs.
Tel: (0254) 672214

BBC/ELECTRON ADVENTURES

NEW WOODLAND TERROR £7.48 (CASS) £10.50 (DISC)

The sequel to FRIENWOOD, many years ago an intrepid adventurer embarked on a quest for the Golden Bird of Paradise. Although successful, our hero released a sinister force which now lurks within the enchanted wood. Your mission is to return the terror to its original resting place and restore peace to an unhappy land!!! This is a complete game, knowledge of Frienwood is not required.

FRIENWOOD £7.48 (CASS) £10.50 (DISC)

An evil wizard has captured the magic golden bird of paradise and imprisoned it in a weird castle in the middle of the enchanted Frienwood. Your quest is to find the bird and set it free, in return the bird will give you health and prosperity. BEWARE! many perils lie before you and every move is fraught with danger!!

BLUE DRAGON £7.48 (CASS) £10.50 (DISC)

Somewhere in a strange and dangerous land lies a fabulous treasure guarded by a fierce dragon. Can you survive the perils that await and recover the treasure or will you meet a nasty end!! What is making terrible slurping noises deep underground and what use is the strange black cloud? Play the game and find out.

SURVIVOR £7.48 (CASS) £10.50 (DISC)

The year is 1910 you are sailing on a steamer bound for Borneo when there is an explosion and the ship sinks. Shipwrecked on a tropical island can you survive and escape back to civilisation, or will you end up in someone's cooking pot!! There is more than one ending to this game, not all of them bad!

All the games are in machine code for fast responses and are text only. Please state which machine when ordering. Prices include VAT and postage within U.K. Cheques payable to MP SOFTWARE or write/phone with your ACCESS/VISA card No. Send S.A.E. for full range of programs and price list or ask your local dealer. Trade enquiries welcome.

We pay well for good original programs contact us today for more details.

EU

MP

SOFTWARE & SERVICES

165, SPITAL ROAD, BROMBOROUGH, MERSEYSIDE L62 2AE. 051-334 3472

Micro Messages

ONE day, while Beethoven was turning in his grave at my rendition of Fur Elise on my Electron – hampered by having mislaid the manual at the time – I went upstairs to have another root around.

Suddenly I became aware that the dulcet tones of my micro were being broadcast through my radio!

Much surprised I tuned it in and discovered it on several frequencies, the strongest being about 95 VHF.

Now I am aware that computers can cause interference but have never met this before. – T. Skinner, Caversham, Reading.

● We haven't come across this either. You're right in thinking that micros can cause interference but this is the first time we've heard of it actually broadcasting! Has any Electron user out there had any similar experiences or got an explanation?

Heads you win

I KNOW that this program is very simple but I am only 10 and I don't know too much about computers.

It's a program where the computer tosses a coin and,

depending which side the coin comes down, it prints heads or tails. When either heads or tails reaches 100 the Electron stops and prints out who won. – Helen Jones, Cheadle Hulme, Cheshire.

```
10 REM COINS
20 REM by Helen Jones
30 REM age 10.5
40 MODE 1
50 LET H=0
60 LET T=0
70 LET A=RND(2)-1
80 IF A=0
    THEN GOTO 150
90 COLOUR 1
100 PRINT "HEADS"
110 PRINT TAB(10)H;" HEADS!"
    :SOUND 1,-15,80,3
120 LET H=H+1
130 IF H=100
    THEN GOTO 290
140 GOTO 70
150 COLOUR 2
160 PRINT "TAILS"
170 LET T=T+1
180 PRINT TAB(5)T;" TAILS!"
    :SOUND 1,-15,100,3
190 IF T=100
    THEN GOTO 210
200 GOTO 70
210 G=GET
220 CLS
230 PRINT
240 PRINT "TAILS HAS WON"
    :SOUND 1,-15,RND(250)
    ,40
250 PRINT "DO YOU WANT
    ANOTHER 60?"
260 INPUT A$
270 IF A$="YES" OR A$="Y"
    THEN GOTO 40
280 GOTO 330
290 G=GET
300 CLS
310 PRINT
```

```
320 PRINT "HEADS HAS WON!"
    :SOUND 1,-15,RND(250)
    ,40
330 CLS
340 PRINT
350 PRINT "GOODBYE"
360 END
370 INPUT "DO YOU WANT
    ANOTHER 60?"
380 IF B$="YES" OR B$="Y"
    THEN GOTO 40
390 CLS
400 PRINT
410 PRINT "GOODBYE"
420 END
```

● Thanks for the program, Helen. Not bad for ten years old. Here at *Electron User* we're wondering what your programming will be like at the ripe old age of 13.

Petal patterns

READERS may enjoy this short program which produces patterns. Values of *N* in the range 2 to 10 give petals. Larger values like 50 give star patterns.

For small values of *N* it is interesting to compare the number of petals with *N*, noting the difference between odd and even values.

```
10 REM ROSE PETAL CURVES
20 REM by R.M. JONES
30 MODE 1
    :GCOL 0,2
    :GCOL 0,129
40 VDU 23,1,0;0;0;0;0;
50 MOVE 640,512
60 PRINT " INPUT N"
70 INPUT N
80 CLG
90 FOR A=0 TO 192
```

```
100 B=A*PI /96
110 DRAW 640+500+COS B+
    SIN (N*B),512+500*
    SIN B*SIN (N*B)
120 NEXT
130 END
```

For a more colourful result add:

```
30 MODE 2
    :C=1
    :D=1
105 IF A=(96+D)DIV N
    THEN C=C+1
    :D=D+1
106 IF C=8
    THEN C=9
107 IF C=15
    THEN C=1
108 GCOL 0,C
```

– R.M. Jones, Cheadle Hulme, Cheshire.

● An interesting little listing, Mr Jones. We notice that you share the same address as Helen – of the heads and tails program. Programs must RUN in the family!

Switched coordinates

IN the sixth paragraph of May's Program Probe, Nigel Peters says that to create a graphics window, VDU24 must be followed by the coordinates of the bottom left corner and then by those of the top left corner.

Shouldn't the second set of coordinates be the top right-hand corner? – Christopher Jones, Cheadle Hulme.

● Quite right, Christopher. As it is, we have Nigel Peters walking round with a big red bow on his right wrist so he'll remember. Incidentally, you're not another of the Jones tribe are you?

WHAT would you like to see in future issues of Electron User?

What tips have you picked up that could help other readers?

Now's here is your opportunity to share your experiences.

Remember that these are the pages that you write yourselves. So tear yourself away from your Electron keyboard and drop us a line.

The address is:
Micro Messages
Electron User
Europa House
68 Chester Road
Hazel Grove
Stockport
SK7 5NY.

Micro Messages

Handling that cursor

I HAVE noticed that some programs listed in *Electron User* have turned off the flashing cursor by different methods. One is using:

```
VDU23;8202;0;0;0;
```

the other being:

```
VDU23,1,0;0;0;0;
```

Can you please explain the difference? Also, having turned it off, how do you turn it on to enable the program to be edited? — **Trevor Harley, Winchester.**

● There is no practical difference between the two ways of switching the cursor off. The one with 8202 is just a left over from the early days of the BBC Micro. The *Electron* accepts it for the sake of compatibility.

To switch the cursor back on just use:

```
VDU 23,1,1;0;0;0;
```

or, in the case of the 8202, just change mode.

Triangular technique

AFTER reading the Eddie-torial in the March *Electron User*, I decided to try my hand at writing a small display program on my *Electron*. After a while I came up with the following eight line program

which fills the screen with colourful triangles.

It uses the PLOT 85 command to draw a triangle on the screen.

The colour of the triangle is determined with GCOL 3,RND(16) which passes each bit of the random number through an exclusive OR gate with the bit pattern of the current background colour.

Although the RND function doesn't contain 0, black is included in the random selection because the *Electron* defaults 16 down to 0, giving black. — **Stephen Harrop, Cardiff.**

```
10 REM COLOURFUL SCREEN
15 REM by Stephen Harrop
20 MODE 2
30 REPEAT
40 X=RND(1279)
50 Y=RND(1023)
60 GCOL 3,RND(16)
70 PLOT 85,X,Y
80 UNTIL FALSE
```

● Thanks for the program Stephen, it's nice to know that our editorials can inspire someone. Or is it just that you prefer programming to reading them?

Optional grids

WE GOT our *Electron* at Christmas and have found it very entertaining, but a great time waster.

I enjoyed Mike Cook's

"Quick on the Draw" program from the May issue of *Electron User*. Although not fully understanding the intricacies of the original, I have added a few extra lines of my own which give two optional grids.

They can be obtained as follows:

X— gives an orthographic grid which helps accurately position lines and polygons.

I— gives an isometric grid which helps draw perspective shapes.

I have found that the best effect is obtained when white or green shapes are shown on a red grid, but from the program the option is yours.

In order to get a really universal program, I tried to incorporate a method of colouring in shapes but without success. Has anyone else managed to do it? If so, I would be interested.

The listing shows the lines that have to be added to the original program to produce the grids. — **Pete Casebeto, Worthing, Sussex.**

```
255 IF A$="I"
    THEN PROCISOGRID
256 IF A$="X"
    THEN PROCORTHOGRID
2061 PRINT "I-DRAW ISOMETRIC
    GRID"
2062 PRINT "X-DRAW ORTHO
    GRAPHIC GRID"
2500 DEF PROCISOGRID
2510 FOR X=30 TO 1260
    STEP 150
2520 MOVE X,0
2530 PLOT 21,X,1020
```

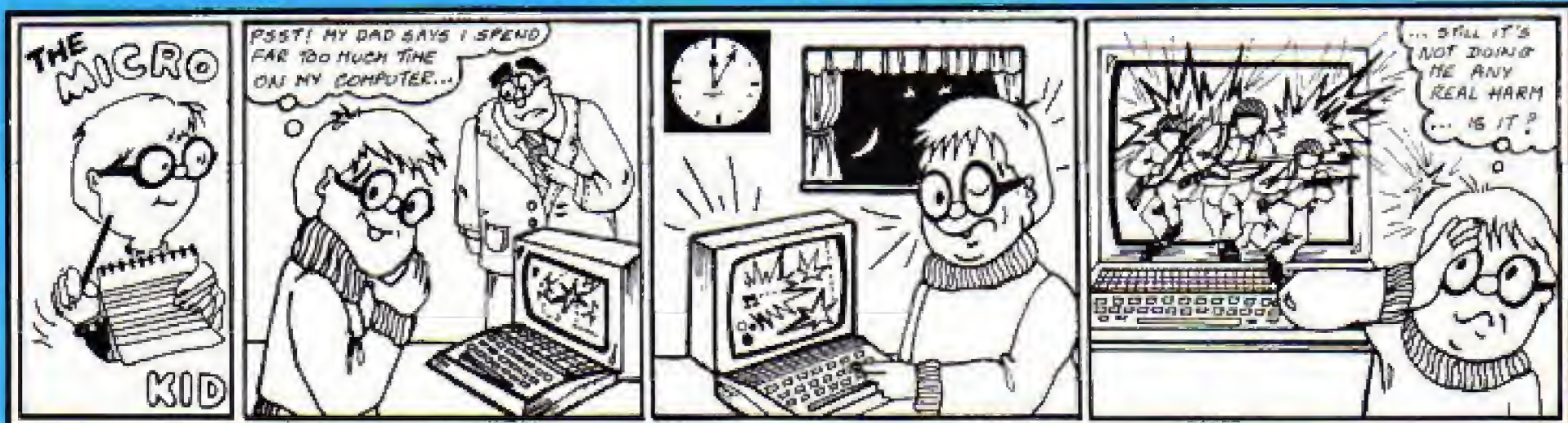
```
2540 NEXT X
2550 FOR Y=-400 TO 1020
    STEP 96
2560 MOVE 0,Y
2570 PLOT 21,1260,Y+400
2580 NEXT Y
2590 FOR Y=0 TO 1500 STEP 96
2600 MOVE 0,Y
2610 PLOT 21,1260,Y-400
2620 NEXT Y
2630 ENDPROC
3000 DEF PROCORTHOGRID
3010 FOR X=0 TO 1260 STEP 100
3020 MOVE X,0
3030 PLOT 21,X,1020
3040 NEXT X
3050 FOR Y=0 TO 1020 STEP 100
3060 MOVE 0,Y
3070 PLOT 21,1260,Y
3080 NEXT Y
3090 MOVE 0,0
3100 ENDPROC
```

● Many thanks, Pete. It's nice to hear of people who adapt and improve our programs. We haven't come across a method of colouring in shapes but no doubt, one of our readers will let us know.

Real killer

AFTER reading about the score of 106,300 on *Killer Gorilla* in the May issue of *Electron User*, I have written in to see if 116,800 is a record. — **Robin Burnage, Holywell, Clwyd.**

● We don't know if it's a record, but it's certainly a good score and we admire your dedication.



SPECIAL OFFER!
Deduct £1 per cassette when ordering 2 or more.

TOP QUALITY SOFTWARE FOR THE ACORN ELECTRON

ACORN ELECTRON



PERCY PENGUIN £7.95
The best version available for the Electron micro. Percy is trapped in an ice maze which is populated by the deadly Snobies. His only hope of survival is to squash them by hurling ice cubes at them. Unfortunately, whenever it seems that he has won, a deathly breed appears. Hi-score, rankings, excellent graphics and sound.
NEW RELEASE



MR. WIZ £7.95
From the author of Percy Penguin, Mr. Wiz is a fast-action multi-scene game. Guide Mr. Wiz around the garden to eat the cherries whilst avoiding the evil gremlins. The gremlins can be killed by dropping apples on them or by throwing the crystal ball. Extra points can be gained by eating the magic mushroom, but beware...this is the home of the gremlins and makes them permanently furious! Sound effects and tunes, hi-score, rankings. Superb arcade-style action.
NEW RELEASE



CHES £7.95
A highly versatile implementation of Chess. Play black or white against the computer or a human opponent. The skill level of the computer's play can be varied widely, and moves are entered either by co-ordinates, cursor control, or joystick control. Moves can be taken back if an error has been made, and the board can be modified at any time. Games can be "saved" or "loaded", and the last game can be replayed. The computer will, if requested, suggest your moves.
NEW RELEASE



CENTBUG £7.95
The centbug descends from the top of the screen weaving intimidacingly between the mushrooms. Your objective is to shoot all the segments of the centbug before it reaches the bottom of the screen. Features include: spiders, snails, flies, 6 skill levels, hi-score, rankings, and increasing difficulty.



ALIEN DROPOUT £7.95
A novel and unusual program. Arcade-action with this exciting multi-stage shooting game. The objective of the game is to shoot the aliens out of their "boxes" before the "boxes" fill up. Once full, the aliens fly down relentlessly, exploding as they hit the ground. The game features include: 6 skill levels, rankings, hi-score, increasing difficulty.



STRANDED £7.95
An adventure game using hi-resolution full-colour graphics. You are stranded on a strange planet, and your mission is to return to civilisation and home. Many of the locations are shown graphically, including the spaceship, the cliffs, the mountains, and (if you succeed) your home. You must carefully explore your environment searching for hidden clues to help you in your quest.
NEW RELEASE



WORLD GEOGRAPHY £7.95
This program covers 166 countries which are divided into 8 categories of difficulty. Each country is pinpointed on an accurate hi-resolution screen map of the world, and the user is asked the capital and/or population. At the end of the test, the percentage of correct answers is given, so that the student can monitor his geographical knowledge.

ALSO AVAILABLE:

INVADERS	£7.95	DISASSEMBLER	£7.95
FRUIT MACHINE	£7.95	DRAUGHTS	£6.95
CONSTELLATION	£7.95	REVERSI	£6.95

DEALERS - Our software is now available at all good dealers including: selected branches of W. H. Smith and Boots; all major computer dealers - Microstyle, Electronequip, 3D Computers, Computerama, GTM Computers, etc.; and our software is also available through all the major distributors, and directly from us.

WE PAY UP TO 20% ROYALTIES FOR HIGH QUALITY BBC MICRO AND ELECTRON PROGRAMS.



SUPERIOR SOFTWARE LTD.

Dept. EU8, Regent House,
Skinner Lane, Leeds 7
Tel: 0532 459453

OUR GUARANTEE

- (1) All our software is available before we advertise.
- (2) All our software is despatched within 48 hours by first-class post.
- (3) In the unlikely event that any of our software fails to load, return your cassette to us and we will immediately send a replacement.

PROGRAM POWER MICRO POWER

KILLER GORILLA

A SUPERB
B.B.C. MICRO
AND ELECTRON
PROGRAM FROM
BRITAIN'S LEADING
SOFTWARE HOUSE!

Scale the ironwork tower to answer the maiden's cries for help. Race along girders, career along conveyors, climb ladders and jump onto moving elevators. Leap the barrels and fireballs or smash them with the hammer. A sensational machine code game for the BBC micro and the Electron

Only £7.95 (incl. VAT)



PROGRAM POWER

PROGRAM POWER MICRO POWER

AVAILABLE FROM ALL GOOD RETAILERS INCLUDING SELECTED BRANCHES OF W. H. SMITH, JOHN MENZIES AND BOOTS. **WRITTEN BY PROGRAMS? WE PAY 20% ROYALTIES!**

The following top titles are available for both the BBC Micro and Electron: Positron £8.95 / Bandits at 3 o'Clock £8.95 / Moonrider £7.95 / Croaker £7.95 / Felix in the Factory £7.95 / Felix and the Fruit Monsters £7.95 / Chess £7.95 / Draw £9.95 / Escape from Moonbase Alpha £7.95 / Cyberton Mission £7.95 / Swoop £7.95 / Intergalactic Trader £8.95

SHOWROOM: NORTHWOOD HOUSE, NORTH STREET, LEEDS LS7 2AA Tel: (0532) 458800
MAIL ORDER: 8/8a REGENT STREET, LEEDS LS7 4PE, Tel: (0532) 683186/696343 55p per order
SPECIAL OFFER: Deduct £1 per cassette when ordering two or more

PROGRAM POWER MICRO POWER